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Part D-E

By

Prof. Yuh-Shan Ho

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# Title: Dalton Transactions

Full Journal Title: Dalton Transactions

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1477-9226

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Journal Country/Territory:

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Subject Categories:

: Impact Factor

? Impert, O., Katafias, A., Kita, P., Mills, A., Pietkiewiez-Graczyk, A. and Wrzeszcz, G. (2003), Kinetics and mechanism of a fast leuco-Methylene Blue oxidation by copper(II)-halide species in acidic aqueous media. *Dalton Transactions*, **3**, 348-353.

Full Text: [2003\Dal Tra3, 348.pdf](2003/Dal%20Tra3,%20348.pdf)

Abstract: The kinetics of a fast leuco-Methylene Blue (LMB) re-oxidation to Methylene Blue (MB) by copper(II)-halide (Cl-, Br-) complexes in acidic aqueous media has been studied spectrophotometrically using a stopped-flow technique. The reaction follows a simple first order rate expression under an excess of the copper(II) species (and H+(aq)), and the pseudo-first order rate constant (k’(obs)) is largely independent of the atmosphere used (air, oxygen, argon). The rate law, at constant Cl- (Br-) anion concentration, is given by the expression: (d[MB+])/dt = ((k(a)K[H+] + k(b))/(1 + K[H+])).[Cu-II][LMB] = k’(obs)[LMB], where K is the protonation constant, and k(a) and k(b) are the pseudo-second order rate constants for protonated and deprotonated forms of LMB, respectively The rate law was determined based on the observed k’(obs) vs. [Cu-II] and [H+] dependences. The rate dramatically increases with [Cl-] over the range: 0.1-1.5 M, reflecting the following reactivity order: Cu2+(aq) << CuCl+(aq) <...< CuCl42-. The slow re-oxidation of LMB by oxygen has also been briefly examined at different [H+]. ESR results provide clear evidence for the formation of an intermediate radical. The mechanistic consequences of all these results are discussed.

Keywords: LeucoMethylene Blue, Ascorbic-Acid, Equilibrium, System

# Title: Danish Medical Bulletin

Full Journal Title: [Danish Medical Bulletin](http://www.danmedbul.dk/Tidligere%20numre/TidligereNumre.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Jorgensen, I.M. (1996), Fatal unintentional child injuries in Denmark: Regional variations in mortality rates and causes of death. *Danish Medical Bulletin*, **43** (1), 92-96.

Full Text: Dan Med Bul43, 92.pdf

Abstract: The purpose of this study was to estimate the risk of death from unintentional injury among children living in Danish counties and to identify high-risk counties of residence for different categories of external causes of injuries.

All Danish children aged 0-14 who died from unintentional injuries (1202) between January 1, 1976 and December 31, 1985 were registered. The study was designed as a historical follow-up study in a dynamic population with particular emphasis on mortality rate (MR), cumulative mortality proportion (CMP) and standardized rate ratio (SRR).

Considerable variation in mortality was observed. The analysis showed that, for boys, the risk of unintentional injury death was 32-48% greater in three of the rural counties than in Denmark as a whole. For girls the risk was 40% higher in one of the rural counties. For both sexes the risk in the area around thr capital was around 50% lower than the national average.

The mortality for the different categories of external causes varied according to county. In the vast majority of counties traffic injuries were the most common category. Pedestrian injuries and bicycle injuries predominated. With the purpose of identifying serious local problems as a basis for injury control/accident prevention, the distribution of the external causes of injuries within each county was stated.

The method seems to be an effective tool in mapping county health conditions. One of the prime objectives in injury stategy is the collection of locally relevant information.

? Andersen, T.F., Madsen, M., Jorgensen, J., Mellemkjaer, L. and Olsen, J.H. (1999), The Danish National Hospital Register - A valuable source of data for modern health sciences. *Danish Medical Bulletin*, **46** (3), 263-268.

Full Text: Dan Med Bul46, 263.pdf

Abstract: The Danish National Hospital Register (LPR) has collected nationwide data on all somatic hospital admissions since 1977, and since 1995 data on outpatients and emergency patients have been included as well. Numerous research projects have been undertaken in the national Danish context as well as in collaboration with international teams, and the LPR is truly a valuable source of data for health sciences, especially in epidemiology, health services research and clinical research. Nearly complete registration of somatic hospital events in Denmark is combined with ideal conditions for longterm follow-up due to the existence of a national system of unique person identification in a population of relative demographic stability. Examples of studies are provided for illustration within three main areas: I: Using LPR for surveillance of the occurrence of diseases and of surgical procedures, II: Using the Register as a sampling frame for longitudinal population based and clinical research, and III: Using the Register as a data source for monitoring outcomes. Data available from the Register as well as studies of the validity of the data are mentioned, and it is described how researchers may get access to the Register. The Danish National Hospital Register is well suited to contribute to international comparative studies with relevance for evidence-based medicine.

Keywords: Denmark, Research, Risk

? Fedder, J., Nielsen, G.L., Petersen, L.J., Rasmussen, C., Lauszus, F.F., Frost, L., Hornung, N., Lederballe, O. and Andersen, J.P. (2011), A substantial number of scientific publications originate from non-university hospitals. *Danish Medical Bulletin*, **58** (11), Article Number: A4332.

Full Text: [2011\Dan Med Bul58, A4332.pdf](2011/Dan%20Med%20Bul58,%20A4332.pdf)

Abstract: INTRODUCTION: As we found no recent published reports on the amount and kind of research published from Danish hospitals without university affiliation, we have found it relevant to conduct a bibliometric survey disclosing these research activities. MATERIAL AND METHODS: We retrieved all scientific papers published in the period 2000-2009 emanating from all seven Danish non-university hospitals in two regions, comprising 1.8 million inhabitants, and which were registered in a minimum of one of the three databases: PubMed MEDLINE, Thomson Reuters Web of Science and Elsevier’s Scopus. RESULTS: In 878 of 1,252 papers, the first and/or last author was affiliated to a non-university hospital. Original papers made up 69% of these publications versus 86% of publications with university affiliation on first or last place. Case reports and reviews most frequently had authors from regional hospitals as first and/or last authors. The total number of publications from regional hospitals increased by 48% over the 10-year period. Publications were cited more often if the first or last author was from a university hospital and even more so if they were affiliated to foreign institutions. Cardiology, gynaecology and obstetrics, and environmental medicine were the three specialities with the largest number of regional hospital publications. CONCLUSION: A substantial number of scientific publications originate from non-university hospitals. Almost two thirds of the publications were original research published in international journals. Variations between specialities may reflect local conditions.

Keywords: Activities, Affiliation, Author, Authors, Bibliometric, Cardiology, Case Reports, Citation, Databases, Environmental, Hospital, Hospitals, Impact, Journals, Medicine, Medline, Obstetrics, Papers, Publications, Pubmed, Research, Science, Scientific Publications, Scopus, Survey, Thomson Reuters, University, University Hospital, Web of Science

# Title: Data Mining and Knowledge Discovery

Full Journal Title: [Data Mining and Knowledge Discovery](http://www.springerlink.com/content/100254/?p=1293abb5c2bb46bc93db356c8c715726&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1384-5810

Issues/Year:

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Publisher:

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Subject Categories:

: Impact Factor

? Wang, X. and Kaban, A. (2008), A dynamic bibliometric model for identifying online communities. *Data Mining and Knowledge Discovery*, **16** (1), 67-107.

Full Text: [2008\Dat Min Kno Dis16, 67.pdf](2008/Dat%20Min%20Kno%20Dis16,%2067.pdf)

Abstract: Predictive modelling of online dynamic user-interaction recordings and community identification from such data becomes more and more important with the widespread use of online communication technologies. Despite of the time-dependent nature of the problem, existing approaches of community identification are based on static or fully observed network connections. Here we present a new, dynamic generative model for the inference of communities from a sequence of temporal events produced through online computer- mediated interactions. The distinctive feature of our approach is that it tries to model the process in a more realistic manner, including an account for possible random temporal delays between the intended connections. The inference of these delays from the data then forms an integral part of our state-clustering methodology, so that the most likely communities are found on the basis of the likely intended connections rather than just the observed ones. We derive a maximum likelihood estimation algorithm for the identification of our model, which turns out to be computationally efficient for the analysis of historical data and it scales linearly with the number of non-zero observed (L + 1)-grams, where L is the Markov memory length. In addition, we also derive an incremental version of the algorithm, which could be used for real-time analysis. Results obtained on both synthetic and real-world data sets demonstrate the approach is flexible and able to reveal novel and insightful structural aspects of online interactions. In particular, the analysis of a full day worth synchronous Internet relay chat participation sequence, reveals the formation of an extremely clear community structure.

Keywords: Agglomerative Clustering Method, Algorithm, Analysis, Approach, Bibliometric, Clustering, Communication, Communities, Community, Community Structure, Computer, Data, Dynamic, EM Algorithm, Events, Feature, Forms, Historical Data, Identification, Inference, Interactions, Internet, Latent Variable Model, Length, Markov Chain, Maximum Likelihood, Memory, Methodology, Mixtures, Model, Modelling, Network, Online Community Identification, Order Markov-Chains, Participation, Problem, Process, Real Time, Scales, Sequence, Structure, Technologies, Temporal, Temporal Delay, Time-Dependent, Version

# Title: Database

Full Journal Title: Database

ISO Abbreviated Title: Database

JCR Abbreviated Title: Database

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Janke, R.V. (1980), Searching the Social-Sciences Citation Index on Brs. *Database*, **3** (2), 19-45.

? Oxley, H. (1998), ISI spins a Web of Science. *Database*, **21** (2), 37-40.

Full Text: [1998\Database21, 37.pdf](1998/Database21,%2037.pdf)

Keywords: ISI, Science, Web

? Wormell, I. (1998), Informetrics - Exploring databases as analytical tools. *Database*, **21** (5), 25-30.

Full Text: [1998\Database21, 25.pdf](1998/Database21,%2025.pdf)

Keywords: Databases

# Title: Database and Expert Systems Applications, Proceedings

Full Journal Title: Database and Expert Systems Applications, Proceedings

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Rho, H., Hou, W.C., Che, D.R. and Wang, C.F. (2003), Querying semistructured data efficiently. *Database and Expert Systems Applications, Proceedings*, **2736**, 18-27.

Abstract: In this paper, we address the issue of fast query processing of semistructured data. To this end, we propose a new index scheme, called the HQ-Index. The HQ-Index consists of two indexes, the H-Index and Q-Index. The H-Index is basically a hash table built upon the path expressions. It serves as a path index. The Q-Index facilitates fast traversal to the ancestor nodes in the graph and the retrieval of requested information. Not only the H-Index and Q-Index have very simple index structures, but also the combined use of them can effectively speed up the evaluation of ordinary path queries. The results of our experiments further confirm the advantage of our approach when compared with the Dataguide, one of the most referenced index schemes for XML and semistructured data.

Keywords: Evaluation, Experiments, Information, XML

# Title: Decision Support Systems

Full Journal Title: [Decision Support Systems](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=01679236)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Abraham, T. and Wankel, C. (1995), Supporting decision support: Where information on DSS is located. *Decision Support Systems*, **14** (4), 299-312.

Full Text: [1995\Dec Sup Sys14, 299.pdf](1995/Dec%20Sup%20Sys14,%20299.pdf)

Abstract: DSS professionals may differ in their opinion and practice as to where they locate the most useful information relevant to their work. Online and other electronic form databases are increasingly becoming the key resource for literature searches. This study empirically compared 31 online databases identified as promising for DSS relevant information according to their coverage of DSS. Rankings for recent years and temporally unconstrained conditions were obtained and discussed. INSPEC was the highest ranked database overall and for recent information. INSPEC was also the highest rated database for coverage of major DSS journals. However, there are many other databases that also provide coverage of DSS materials. It is hoped that DSS professionals will use these results to improve the effectiveness of their information search process.

Keywords: Bibliometrics, Database, Databases, Decision Support Systems, DSS, DSS Research Methods, ESS, Executive Support Systems, Expert Systems, Information Sources, Journals, Literature, Management Information Systems, MIS, MMS, Model Management Systems, Online Databases, Simulation, Systems

Eom, S.B. (1996), Mapping the intellectual structure of research in decision support systems through author cocitation analysis (1971-1993). *Decision Support Systems*, **16** (4), 315-338.

Full Text: [1996\Dec Sup Sys16, 315.pdf](1996/Dec%20Sup%20Sys16,%20315.pdf)

Abstract: This study applies factor analysis of an author cocitation frequency matrix derived from a database file that consists of a total of 23, 768 *cited* reference records taken from 944 *citing* articles. Factor analysis extracted eleven factors consisting of six major areas of DSS research (group DSS, foundations, model management, interface systems, multicriteria DSS, and implementation) and five contributing disciplines (multiple criteria decision making, cognitive science, organizational science, artificial intelligence, and systems science). This research provides hard evidence that the decision support system has made meaningful progress over the past two decades and is in the process of solidifying its domain and demarcating its reference disciplines. Especially, much progress has been made in the subareas of model management such as representation, model base processing, model integration, and artificial intelligence application to model management leading towards the development of a theory of models. To facilitate the transition from the pre- to post-paradigm period in DSS research, this study has completed important groundwork.

Keywords: Decision Support Systems, Intellectual Structure, Bibliometrics, Cocitation Analysis, Factor Analysis

? O’Leary, D.E. (2008), The relationship between citations and number of downloads in *Decision Support Systems*. *Decision Support Systems*, **45** (4), 972-980.

Full Text: [2008\Dec Sup Sys45, 972.pdf](2008/Dec%20Sup%20Sys45,%20972.pdf)

Abstract: In this increasingly digital age, the number of times a paper is downloaded and the number of citations to it are becoming indicators of the interest, visibility and impact of the paper. As a result. downloads and citations increasingly are becoming a part of the evaluation process of faculty, departments and universities. This paper finds that the number of citations and downloads are closely related. A statistically significant relationship is found between the number of citations from different citation sources and the number of downloads of Decision Support Systems. In addition. the different the number of citations from sources of citation information are found to be highly correlated with each other. (C) 2008 Elsevier B.V. All rights reserved.

Keywords: Age, Citation, Citations, Decision Support Systems, Downloads, Elsevier Science, Evaluation, Faculty, Google Scholar, h-Index, Impact, Indicators, Information, ISI World of Knowledge, NOV, Process, Rights, Scopus, SI, Sources, SSCI, Universities, Visibility

? van Baalen, P.J. and van Fenema, P.C. (2009), Instantiating global crisis networks: The case of SARS. *Decision Support Systems*, **47** (4), 277-286.

Full Text: [2009\Dec Sup Sys49, 277.pdf](2009/Dec%20Sup%20Sys49,%20277.pdf)

Abstract: In this paper we build a multi-theoretical and multi-level framework for analyzing Global Crisis Networks (GCN). These information-centric. heterarchically structured networks are instantiated in response to major disasters with global impact. The instantiation of GCN is conceived as a problem of collective action. Its success depends on multi-level preparedness, and network orchestration and participation. With this framework we analyze the SARS outbreak in 2002 and its successful containment in 2003. We analyze two individual country cases. Canada and China and discuss the role of the network orchestrator, the World Health Organizations. The paper concludes with implications for research and practice. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Global Crisis Networks, Global Decision Making, Network Instantiation, Network Coordination, Global Diseases, Acute Respiratory Syndrome, High-Reliability, Knowledge, Systems, Organizations, Communication, Coordination, Cooperation, Innovation, Dilemmas

? Lee, Y. (2011), Understanding anti-plagiarism software adoption: An extended protection motivation theory perspective. *Decision Support Systems*, **50** (2), 361-369.

Full Text: 2010\Dec Sup Sys50, 361.pdf

Abstract: This study investigates factors affecting the adoption of anti-plagiarism software. Using protection motivation theory as a basis, this research examines the influence of threat and coping appraisals, along with social influences, moral obligation, and actual control variables, on the adoption of anti-plagiarism software. A field survey of 218 faculty members working at U.S. public universities reveals that threat appraisals have a stronger influence on the adoption of anti-plagiarism software than do coping appraisals. The faculty members’ moral obligation, academic rank, class size, percentage of creative assignments, and gender significantly affect software adoption, whereas social influence does not. Key implications for theory and practice are discussed. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Anti-Plagiarism Software, Cancer Risk, Consumption, Determinants, Ethical Decision-Making, Fear Appeals, Health Threat, Internet Plagiarism, Intervention, Partial Least Squares, Planned Behavior, Protection Motivation Theory, Research, Self-Efficacy, Survey, Technology Acceptance Model

? Liao, W.P., Lin, T.M.Y. and Liao, S.H. (2011), Contributions to Radio Frequency Identification (RFID) research: An assessment of SCI-, SSCI-indexed papers from 2004 to 2008. *Decision Support Systems*, **50** (2), 548-556.

Full Text: [2010\Dec Sup Sys50, 548.pdf](2010/Dec%20Sup%20Sys50,%20548.pdf)

Abstract: The research literature on Radio Frequency Identification (RFID) has grown exponentially in recent years. In a domain where new concepts and techniques are constantly being introduced, it is of interest to analyze recent trends in this literature. Although some attempts have been made in the past to review this stream of research, there has been no attempt to assess the contributions to this literature by individuals and institutions. This study assesses the contributions of individual researchers and institutions from 2004 to 2008, based on their publications in SCI- or SSCI-indexed journals. The findings of this study offer researchers a unique view of this field and some directions for future research. Crown Copyright (C) 2010 Published by Elsevier B.V. All rights reserved.

Keywords: Assessment, Challenges, Citation Analysis, Consumer, Field, Implementation, Institutions, International-Business, Journals, Literature, Operations, Papers, Publication Productivity, Publications, Radio Frequency Identification (RFID), Research, Review, RFID, Rights, SCI, Science Citation Index (SCI), Social Science Citation Index (SSCI), Stream, Supply-Chain, Systems, Techniques, Technology, Trends

# Title: Defence Science Journal

Full Journal Title: [Defence Science Journal](http://vnweb.hwwilsonweb.com/hww/Journals/getIssues.jhtml?sid=HWW:OMNIS&id=12798); [Defence Science Journal](http://publications.drdo.gov.in/ojs/index.php/dsj/issue/archive)

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JCR Abbreviated Title:

ISSN: 0109-5641

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Subject Categories:

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? Kostoff, R.N., Morse, S.A. and Oncu, S. (2008), Structure of the anthrax research literature. *Defence Science Journal*, **58** (5), 678-685.

Full Text: [2008\Def Sci J58, 678.pdf](2008/Def%20Sci%20J58,%20678.pdf)

Abstract: Text mining was used to extract technical intelligence from the open source global anthrax research literature. An anthrax-focused query was applied to the Science Citation Index/Social Science Citation Index (SCI/SSCI) (SCI, 2006) databases. The anthrax research literature infrastructure (prolific authors, key journals/institutions/ countries, most cited authors/journals/ documents) was obtained using bibliometrics, and the anthrax research literature technical structure (hierarchical taxonomy) was obtained using computational linguistics/document Clustering.

Keywords: Anthrax, Anthraxin, Authors, Bacillus Anthracis, Bibliometrics, Bibliometrics, Biodefence, Biological Weapons, Biosecurity, Biosurety, Bioterrorism, Bioterrorism-Related Anthrax, Biowarfare, Bioweapons, Citation, Citation Analysis, Citation Index, Clustering, Computational Linguistics, Countries, Database Tomography, Databases, Information Technology, Infrastructure, Intelligence, Literature, Research, SCI, Science, Science Citation Index, Taxonomy, Text Mining

# Title: Dementia and Geriatric Cognitive Disorders

Full Journal Title: Dementia and Geriatric Cognitive Disorders

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Guehne, U., Angermeyer, M.C. and Riedel-Heller, S. (2006), Is mortality increased in mildly cognitively impaired individuals? A systematic literature review. *Dementia and Geriatric Cognitive Disorders*, **21** (5-6), 403-410.

Abstract: Numerous studies have focused on the effect of mild cognitive impairment in elderly people. However, the impact of mild cognitive impairment on mortality has rarely been considered so far. This paper reviews recent work on mild cognitive impairment and its mortality risk. Relevant articles were identified by a systematic search of the literature published since 1990 using the databases PUBMED, Web of Science and PSYNDEXplus, bibliographies of articles identified and of earlier reviews. Those studies were considered which predominantly included persons aged 65 and over and which relied on population-based samples. Thus only eight studies could be identified. In general, the relative risk (RR) for subjects with mild cognitive impairment according to different concepts in comparison to non-affected persons varies from 1.0 to 1.9. However, only few studies are available, and a comparison of the literature is problematic, due to variations in criteria and methodology. Copyright (C) 2006 S. Karger AG, Basel.

Keywords: 5-Year Follow-Up, Age, Aged, Copyright, Databases, Dementia, Elderly, Elderly Canadians, Elderly People, Functional Limitation, Health, Impact, Literature, Literature Review, Memory Impairment, Methodology, Mild Cognitive Impairment, Mortality, Population, Predictive-Validity, Prevalence, Pubmed, Relative Risk, Review, Risk, Science, Sociodemographic Characteristics, Systematic, Systematic Literature Review, Terminal Decline, Web of Science

? Cherbuin, N., Leach, L.S., Christensen, H. and Anstey, K.J. (2007), Neuroimaging and APOE genotype: A systematic qualitative review. *Dementia and Geriatric Cognitive Disorders*, **24** (5), 348-362.

Abstract: Apolipoprotein E (APOE) is the major genetic risk factor for late-onset Alzheimer’s disease (AD) and has also been implicated in cardiovascular disease, cognitive decline and cognitive changes in healthy ageing. The aim of this paper is to systematically review and critically assess the association between the APOE genotype and structural/functional cerebral changes as evidenced by brain imaging studies. A second aim is to determine whether these observed associations between APOE and the brain reflect changes which are consistent with the progression of AD neurodegenerative changes described in Braak stages. A search of PUBMED, Psycinfo, and Web of Science databases identified 64 articles available for qualitative review. The review found that presence of the APOE epsilon 4 allele is associated with (1) hippocampal, amygdalar and entorhinal cortex atrophy, (2) increased brain atrophy, (3) increased white matter hyperintensity volumes and (4) altered cerebral blood flow and glucose metabolism patterns. It is possible that there are critical age ranges when these effects are evident and that the APOE epsilon 2 genotype might present a risk. We conclude that structural brain change is associated with the APOE genotype and that it is more salient in younger ageing individuals. Copyright (c) 2007 S. Karger AG, Basel.

Keywords: Ageing, Alzheimer’S Disease, Apolipoprotein E, Apolipoprotein-E Epsilon-4, Blood, Blood Flow, Braak Stages, Brain, Cardiovascular, Cardiovascular Disease, Cerebral Glucose-Metabolism, Cognitive Aging, Copyright, Databases, Disease, E Polymorphism, E Type-4 Allele, Genetic, Genetic Risk, Hippocampal Atrophy, Imaging, Magnetic Resonance Imaging, Mild Cognitive Impairment, Onset Alzheimers-Disease, Regional Brain Atrophy, Review, Risk, Science, Systematic, Temporal-Lobe Atrophy, Web of Science, White Matter, White-Matter Lesions

? Crichton, G.E., Bryan, J., Murphy, K.J. and Buckley, J. (2010), Review of dairy consumption and cognitive performance in adults: Findings and methodological issues. *Dementia and Geriatric Cognitive Disorders*, **30** (4), 352-361.

Abstract: Background: Diet is a modifiable factor that could be targeted as an appropriate intervention to optimise cognitive health and well-being in ageing. Aim: The aim of this systematic review was to consider current evidence for an association between dairy intake and cognitive functioning. Methods: Searches of the electronic databases MEDLINE, EMBASE, Web of Science, CINAHL, and PsychInfo were undertaken to identify peer-reviewed journal articles that reported on associations between dairy consumption and cognitive outcomes. Results: Three cross-sectional and 5 prospective studies were identified. Poorer cognitive function and an increased risk for vascular dementia were found to be associated with a lower consumption of milk or dairy products. However, the consumption of whole-fat dairy products may be associated with cognitive decline in the elderly. Conclusion: Methodological variability and study limitations do not enable conclusions regarding optimal dairy intake and cognitive performance to be drawn. Randomised controlled trials are needed to confirm the relationship between dairy intake and cognition. Copyright (C) 2010 S. Karger AG, Basel.

Keywords: Adults, Ageing, Alzheimers-Disease, Body-Fat, Cognition, Cognitive Functioning, Copyright, Dairy Food Intake, Databases, Dementia, Diabetes-Mellitus, Elderly, Fat Intake, Follow-up, Insulin Sensitivity, Intervention, Journal, Magnesium, Methodological Review, Methods, Outcomes, Performance, Prospective Studies, Review, Risk, Risk-Factors, Science, Systematic, Systematic Review, Variability, Web of Science, Weight Management, White-Matter Hyperintensities

# Title: Dental Materials

Full Journal Title: [Dental Materials](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6195&_auth=y&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=558a9287fb391197978d399f208aa81d)

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Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bayne, S.C., Swift, E.J. and Thompson, J.Y. (1995), Review of dental materials citations: Part A, January to June 1995. *Dental Materials*, **11** (4), 281-293.

Full Text: [1995\Den Mat11, 281.pdf](1995/Den%20Mat11,%20281.pdf)

Abstract: Objective: Electronic databases are an excellent resource for identifying relevant references for research and education projects. However, these databases are not yet a substitute for direct inspection of the literature because: (a) there still is a lag of many months between journal issue publication and updates of the database, and (b) most databases selectively report a portion of the entire literature. The objective was to identify and categorize all the dental materials citations in biomedical journals that were published from January 1995 through June 1995. Methods: Seventeen primary and 56 secondary dental journals were manually searched via their tables of contents to detect dental materials publications from January to June of 1995. Denial materials citations were categorized into 17 major sections and further divided into several subsections. The review excluded case reports and literature primarily related to dental implants or biomedical materials outside of dentistry. Results: Three hundred-sixty-nine citations were identified. The greatest number of citations were associated with dentin bonding, composites, and glass ionomers. There was no significant increase in dental materials publications vs. the number reported for 1994. Significance: This list provides a comprehensive source for review by academicians and researchers to bridge the gap between initial publication and electronic citation.

Keywords: Publications, Research

? Swift, E.J., Thompson, J.Y. and Bayne, S.C. (1996), Review of dental materials citations: Part B. July to December 1995. *Dental Materials*, **12** (2), 127-141.

Full Text: [1996\Den Mat12, 127.pdf](1996/Den%20Mat12,%20127.pdf)

Abstract: Objective: A lag of many months occurs between journal issue publication and updates to electronic databases. The objective of this literature analysis was to identify and categorize all of the dental materials citations in biomedical journals that were published from July 1995 through December 1995. Methods: Seventeen primary and 51 secondary journals were searched using their tables of contents to detect and record dental materials publications from July to December of 1995. Those journals that were typically rich in dental materials articles were classified as primary ones. Citations were categorized into 17 topics and divided into subsections. The review excluded case reports, most literature related primarily to dental implants, and most articles on biomedical materials used outside of the field of general dentistry. Results. The greatest number of citations was related to topics of dentin bonding and resin-based restorative filling materials (composites and glass ionomers). There was no major change in the number of dental materials publications per year reported from 1993 (n = 786) to 1995 (n = 751). Significance: This citation list provides a comprehensive resource for use by academicians and researchers to bridge the gap between initial publication and access to electronic searching methods for major databases.

Keywords: Publications

? Attin, T., Hannig, C., Wiegand, A. and Attin, R. (2004), Effect of bleaching on restorative materials and restorations: A systematic review. *Dental Materials*, **20** (9), 852-861.

Full Text: 2004\Den Mat20, 852.pdf

Abstract: Objective: Internal and external bleaching procedures utilizing 3-35% hydrogen peroxide solutions or hydrogen peroxide releasing agents, such as carbamide peroxide or sodium perborate, can be used for whitening of teeth. The purpose of the review article was to summarize and discuss the available information concerning the effects of peroxide releasing bleaching agents on dental restorative materials and restorations. Sources: Information from all original scientific full papers or reviews listed in PUBMED or ISI Web of Science (search term: bleaching AND (composite OR amalgam OR glass ionomer OR compomer OR resin OR alloy) were included in the review. Data: Existing literature reveals that bleaching therapies may have a negative effect on physical properties, marginal integrity, enamel and dentin bond strength, and color of restorative materials as investigated in numerous in vitro studies. However, there are no reports in literature indicating that bleaching may exert a negative impact on existing restorations requiring renewal of the restorations under clinical conditions. Conclusion: Bleaching may exert a negative influence on restorations and restorative materials. Advice is provided based on the current literature to minimize the impact of bleaching therapies on restorative materials and restorations. (C) 2004 Academy of Dental Materials. Published by Elsevier Ltd. All rights reserved.

Keywords: 10-Percent Carbamide Peroxide, 30-Percent Hydrogen-Peroxide, Amalgam, Bleaching, Bond Strength, Bonding, Composite Resin, Composite Resin Color, Dental Materials, Impact, In-Vitro, Information, Isi, Literature, Mercury Release, Papers, Peroxide, Pubmed, Pulp Chamber, Restoration, Review, Scanning Electron-Microscopy, Science, Sources, Systematic, Systematic Review, Unbleached Bovine Enamel, Web of Science

? Ruse, N.D. (2008), Propagation of erroneous data for the modulus of elasticity of periodontal ligament and gutta percha in FEM/FEA papers: A story of broken links. *Dental Materials*, **24** (12), 1717-1719.

Full Text: 2008\Den Mat24, 1717.pdf

Abstract: Objective. This brief review essay was triggered by the discovery of two errors that have been perpetuated in the dental literature for the last quarter century and is intended to alert the research community. Methods. An extensive search of the published literature, using PUBMED and Web of Science search engines, electronic journal resources, and several trips to the library for manual retrievals of articles were used to retrieve hundreds of articles reporting on finite element modeling - finite element analysis (FEM/FEA) involving periodontal ligament (PDL) and gutta percha (GP). Results. The literature search revealed that erroneous values for the modulus of elasticity of PDL and GP were introduced in 1980 and in 1983, respectively. The identified errors range between two to three orders of magnitude and have been used in hundreds of FEM/FEA papers. Significance. The finding casts serious doubts regarding the validity of the results published in hundreds of papers and highlights the importance of checking the references cited and citing, or at least confirming, primary sources rather than citing citations. (C) 2008 Academy of Dental Materials. Published by Elsevier Ltd. All rights reserved.

Keywords: Analysis, Behavior, Bone, Citations, Dental Implants, Finite Element Modeling - Finite Element Analysis (FEM, FEA), Finite-Element-Analysis, Gutta Percha, Human Periodontal Ligament, Incisor, Journal, Literature, Mechanical-Properties, Methods, Modeling, Modulus of Elasticity, Papers, Post, Primary, Pubmed, Research, Review, Science, Strength, Stress-Distribution, Teeth, Validity, Web of Science

? Attin, T., Schmidlin, P.R., Weyehaupt, F. and Wiegand, A. (2009), Influence of study design on the impact of bleaching agents on dental enamel microhardness: A review. *Dental Materials*, **25** (2), 143-157.

Full Text: 2009\Den Mat25, 143.pdf

Abstract: Objective. Numerous studies investigated the impact of bleaching procedures on enamel microhardness, The outcomes of these studies reveal inconsistencies regarding the fact whether a microhardness reduction due to bleaching occurs or not. Aim of the present review was to summarize the existing literature of external bleaching therapies, which used microhardness tests for evaluation of possible effects on enamel and to weigh up different parameters of the study designs with respect to the outcome of these studies. Methods. The data from original scientific full papers listed in PUBMED or ISI Web of Science (search term: enamel and (bleaching or peroxide) and (hardness or microhardness or Knoop or Vickers)) and received by additional hand-search meeting the inclusion criteria were included in the review. Influences of different parameters on the outcome of the bleaching treatments were analyzed with the Fisher’s-exact-test. Results. A total of 5S studies were identified with 166 hardness measurements conducted directly after bleaching and 69 measurements performed after a post-treatment episode. Directly after bleaching, 84 (51%) treatments showed microhardness reduction compared to baseline, whereas 82 (49%) did not yield microbardness reduction. After the post-treatment episode, 20 (29%) treatments showed hardness reduction and 49 (71%) did not. A significant higher number of bleaching treatments resulting in enamel microhardness reduction were observed, when artificial instead of human saliva was used for storage of the enamel samples in the intervals between the bleaching applications and when no fluoridation measures were applied during or after the bleaching phase. Significance. The review shows that in those studies, which simulated the intraoral conditions as closely as possible, the risk of enamel microhardness decrease due to bleaching treatments seems to be reduced. Nevertheless more in situ- and in vivo-studies are needed to verify this observation. (c) 2008 Academy of Dental Materials. Published by Elsevier Ltd. All rights reserved.

Keywords: 10-Percent Carbamide Peroxide, Bleaching, Bovine, Bovine Enamel, Demineralized Enamel, Evaluation, Hardness, Human, Hydrogen-Peroxide, Impact, In-Vitro Evaluation, Inconsistencies, ISI, Literature, Methods, Mineral-Content, Observation, Outcome, Outcomes, Papers, Peroxide, Pubmed, Remineralization Periods, Review, Risk, Science, Subsurface Microhardness, Surface Microhardness, Tetracycline-Stained Teeth, Web of Science

# Title: Dental Traumatology

Full Journal Title: Dental Traumatology

ISO Abbreviated Title:

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ISSN:

Issues/Year:

Journal Country/Territory:

Language:

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Publisher Address:

Subject Categories:

: Impact Factor

? Glendor, U. (2009), Aetiology and risk factors related to traumatic dental injuries - A review of the literature. *Dental Traumatology*, **25** (1), 19-31.

Full Text: [2009\Den Tra25, 19.pdf](2009/Den%20Tra25,%2019.pdf)

Abstract: During the past 30 years, the number of aetiologies of traumatic dental injuries (TDIs) has increased dramatically in the literature and now includes a broad spectrum of variables, including oral and environmental factors and human behaviour. The aim of this study is to present an international review of well-known as well as less well-known unintentional and intentional causes of TDIs. Moreover, some models that are useful in investigating contact sport injuries are presented. The databases of Medline, Cochrane, Social Citation Index, Science Citation Index and CINAHL from 1995 to the present were used. Oral factors (increased overjet with protrusion), environmental determinants (material deprivation) and human behaviour (risk-taking children, children being bullied, emotionally stressful conditions, obesity and attention-deficit hyperactivity disorder) were found to increase the risk for TDIs. Other factors increasing the risk for TDIs are presence of illness, learning difficulties, physical limitations and inappropriate use of teeth. A new cause of TDIs that is of particular interest is oral piercing. In traffic facial injury was similar in unrestrained occupants (no seat belts) and occupants restrained only with an air bag. Amateur athletes have been found to suffer from TDIs more often than professional athletes. Falls and collisions mask intentional TDIs, such as physical abuse, assaults and torture. Violence has increased in severity during the past few decades and its role has been underestimated when looking at intentional vs unintentional TDIs. There are useful models to prevent TDIs from occurring in sports. WHO Healthy Cities and WHO Health Promoting Schools Programmes offer a broad solution for dental trauma as a public health problem. The number of known causes of TDIs has grown to alarming levels, probably because of increased interest of the causes and the underlying complexity of a TDI. Accepted oral, environmental and human aetiological factors must therefore be included in the registration of TDIs.

Keywords: 12-Year-Old School-Children, Aged 7-18 Years, Anterior Teeth, Attention-Deficit, Hyperactivity Disorder, Citation, Gingival Recession, Maxillofacial Fractures, Medline, Mouthguard Use, Oral Trauma, Permanent Incisors, Preschool-Children, Public Health, Risk Factors, Science

? Magunacelaya, M.B. and Glendor, U. (2011), Surfing for mouth guards: Assessing quality of online information. *Dental Traumatology*, **27** (5), 334-343.

Full Text: [2011\Den Tra27, 334.pdf](2011/Den%20Tra27,%20334.pdf)

Abstract: Introduction: The Internet is an easily accessible and commonly used source of health-related information, but evaluations of the quality of this information within the dental trauma field are still lacking. Aim: The aims of this study are (i) to present the most current scientific knowledge regarding mouth guards used in sport activities, (ii) to suggest a scoring system to evaluate the quality of information pertaining to mouth guard protection related to World Wide Web sites and (iii) to employ this scoring system when seeking reliable mouth guard-related websites. Materials and methods: First, an Internet search using the keywords ‘athletic injuries/prevention and control’ and ‘mouth protector’ or ‘mouth guards’ in English was performed on PubMed, Cochrane, SvedMed+ and Web of Science to identify scientific knowledge about mouth guards. Second, an Internet search using the keywords ‘consumer health information Internet’, ‘Internet information public health’ and ‘web usage-seeking behaviour’ was performed on PubMed and Web of Science to obtain scientific articles seeking to evaluate the quality of health information on the Web. Based on the articles found in the second search, two scoring systems were selected. Then, an Internet search using the keywords ‘mouth protector’, ‘mouth guards’ and ‘gum shields’ in English was performed on the search engines Google, MSN and Yahoo. The websites selected were evaluated for reliability and accuracy. Results: Of the 223 websites retrieved, 39 were designated valid and evaluated. Nine sites scored 22 or higher. The mean total score of the 39 websites was 14.2. Fourteen websites scored higher than the mean total score, and 25 websites scored less. The highest total score, presented by a Public Institution Web site (Health Canada), was 31 from a maximum possible score of 34, and the lowest score was 0. Conclusion: This study shows that there is a high amount of information about mouth guards on the Internet but that the quality of this information varies. It should be the responsibility of health care professionals to suggest and provide reliable Internet URL addresses to patients. In addition, an appropriate search terminology and search strategy should be made available to persons who want to search beyond the recommended sites.

Keywords: Accuracy, Activities, Anesthesia-Related Information, Breast-Cancer, Canada, Care, Cochrane, Consumer, Control, Education, Health, Health Care, Health Information, Information, Internet, Knowledge, Mouthguards, Online Information, Patients, Performance, Public Health, Pubmed, Reliability, Science, Sport, Strategy, Trauma, Traumatic Dental Injuries, Web of Science, Websites, World Wide Web, World-Wide-Web

# Title: Dentomaxillofacial Radiology

Full Journal Title: Dentomaxillofacial Radiology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Donald-Jankowski, D.S. (2003), Florid cemento-osseous dysplasia: A systematic review. *Dentomaxillofacial Radiology*, **32** (3), 141-149.

Abstract: Objectives: To evaluate the principal features of florid cemento-osseous dysplasia (FCOD) by systematic review (SR), with particular regard to comparison of Oriental with non-Oriental populations, and of reports derived from pathology files with those from non-pathology sources. Methods: All alternative names for FCOD were used as search terms for two electronic databases, namely MEDLINE and “Web of Science”. Only multiple forms of cemento-osseous dysplasia occurring in a series in the reporting authors’ case load were considered. Results: MEDLINE produced more SR-identified reports. The search terms “Cementoma” and “Osseous Dysplasia” were the most effective for both databases. One hundred and fifty-eight cases of FCOD were observed in 17 series of patients reported in 16 SR-identified reports. Fifty-nine percent of cases were found in Blacks, 37% in Orientals and 3% in Caucasians. Ninety-seven percent were females. Fifty percent of cases in the SRs were observed incidentally. Pain was most frequent in those with presenting symptoms, and was significantly more frequent in the Oriental series. In two studies on the same Chinese community, those cases found incidentally on radiographs alone were significantly younger than those with symptoms in the pathology files. Conclusion: The nomenclature for FCOD is extensive, but older and more general terms were more effective in recalling SR-identified reports. Cases in a report based on pathology files appear to be older than those in a report based on radiology alone files. With the exception of a higher prevalence of pain in Orientals, mainly Chinese, there did not appear to be any differences in presentation compared with that observed in Black communities.

Keywords: Authors, Benign Fibroosseous Lesions, Bone, Databases, Diffuse Sclerosing Osteomyelitis, Gigantiform Cementoma, Hong-Kong Chinese, Jaw Lesions, Jaws, Methods, Multiple Enostosis, Odontogenic Tumours, Cementoma, Odontogenic-Tumors, Origin, Osteitis, Pain, Pathology, Prevalence, Radiology, Review, Symptoms, Systematic, Systematic Review

# Title: Depression and Anxiety

Full Journal Title: Depression and Anxiety

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JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Elsevier

Publisher Address:

Subject Categories:

: Impact Factor

López-Muñoz, F., Alamo, C., Rubio, G., García-García, P., Martín-Agueda, B. and Cuenca, E. (2003), Bibliometric analysis of biomedical publications on SSRI during 1980-2000. *Depression and Anxiety*, **18** (2), 95-103.

Full Text: [2003\Dep Anx18, 95.pdf](2003/Dep%20Anx18,%2095.pdf)

Abstract: We performed a bibliometric study of the scientific publications referring to selective serotonin reuptake inhibitors (SSRIs). The database used was EMBASE: Psychiatry. We applied the principal bibliometric indicators: Price’s and Bradford’s laws on the increase or dispersion of scientific literature, Lotka’s law on the productivity of authors, the participation index (Pal) of countries, the productivity index (PI) of authors, and the collaboration index. By means of manual coding, documents were classified according to type of study and to the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) or nonpsychiatric categories. We analysed 3,622 original documents published between 1980 and 2000. Our results show nonfulfilment of Price’s law because production on SSRIs does not grow exponentially (r = 0.937 vs. r = 0.946, after linear adjustment). The journal most employed is the journal of Clinical Psychiatry (Bradford’s first zone). The United States is the most productive country (PaI = 41.50). The documents were distributed in four groups: experimental pharmacology (8.38%), tolerance and safety (34.94%), clinical efficacy (49.11%), and not specified (7.56%). The drug most studied was fluoxetine (1,745 articles), followed by paroxetine (659). The DSM-IV diagnostic categories most studied were depression (834), obsessive-compulsive disorder (171), and panic disorder (75). The control antidepressants most used in comparative clinical studies were amitriptyline (51) and imipramine (42). The results of the present study show that the SSRIs are not solely antidepressant drugs, but also have a wide range of uses both within the psychiatric sphere (especially in the field of anxiety) and outside it, which explains the considerable scientific production generated in relation to these drugs. (C) 2003 Wiley-Liss, Inc.

Keywords: Analysis, Antidepressant, Anxiety, Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Bibliometric Study, Biomedical, Clinical, Clinical Studies, Coding, Collaboration, Control, Country, Database, Depression, Diagnostic and Statistical Manual of Mental Disorders, Dispersion, Distributed, Drug, Drugs, DSM-IV, Efficacy, Experimental, Field, First, Index, Indicators, Journal, Law, Laws, Literature, Participation, Pharmacology, Productivity, Publications, Safety, Scientific Literature, Scientific Production, Scientific Publications, Serotonin, Tolerance, United States

# Title: Der Nervenarzt

Full Journal Title: Der Nervenarzt

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JCR Abbreviated Title:

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Publisher: [Elsevier Springer-Verlag Heidelberg](http://www.springerlink.com/app/home/main.asp?wasp=cmw7ypruqk7vneg2dr2p)

Publisher Address:

Subject Categories:

: Impact Factor

Pantel, J. and Mundt, C. (1999), Über die Evaluation von Forschungsleistungen in der Psychiatrie: Möglichkeiten und Grenzen bibliometrischer Analysen. *Der Nervenarzt*, **70** (3), 281-287.

Full Text: [1999\Der Ner70, 281.pdf](1999/Der%20Ner70,%20281.pdf)

Abstract: Recent scientific and economic developments have emphasized the need for objective and operationalized criteria for the evaluation of collective and individual research performance. In this context the present article discusses the possibilities and limitations of bibliometric analysis in the evaluation of psychiatric research. Taking into account recent scientometric knowledge, the potentials and pitfalls of the so called impact factor are critically discussed with respect to its usefulness in the evaluation of psychiatric research performance in Germany. A major criticism arises from the observation that the unreflecting use of the impact factor may overemphasize quantitative aspects to the disatvantage of qualitative aspects of research. This may however lead to unwanted distortions and misjudgements. The critical analysis of the current use of scientometric indices in the evaluation process emphasizes the need for alternative criteria, which should take into account disciplinary as well as national idiosyncrasis. Accordingly, the authors aim to induce and contribute to a discussion process within the scientific community, which may lead to a more appropriate evaluation of psychiatric research performance.

Keywords: Schlü, Sselwö, Rter Forschungsevaluation, Impact-Faktor, Psychiatrische Forschung, Szientometrie

# Title: Dermatologic Surgery

Full Journal Title: [Dermatologic Surgery](http://www3.interscience.wiley.com/journal/121557229/grouphome/home.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories

: Impact Factor

? Nguyen, N.Q. and Moy, R.L. (2000), Authors in *Dermatologic Surgery*. *Dermatologic Surgery*, **26** (12), 1092-1095.

Full Text: [2000\Der Sur26, 1092.pdf](2000/Der%20Sur26,%201092.pdf)

Abstract: Authors of scientific papers have been evaluated in the past by how frequently the medical literature cites them. In this analysis, we specifically identify those individuals who have contributed to the field of cutaneous surgery through publications in Dermatologic Surgery. We further analyze those publications frequently cited in Dermatologic Surgery, allowing us to determine topics of utmost value and interest. Using a citation database provided by the Institute for Scientific Information, we first identify all publications and citations from 1981 to 1999 for Dermatologic Surgery and the Journal of Dermatologic Surgery and Oncology (the previous name for this journal). Of the original articles published during this time frame, 3099 authors published 2167 papers. We quantify the publications from each author, and identify 57 authors with at least 10 original articles. When expanding the database parameters to include original articles, reviews, notes, and proceedings (as defined by the Science Citation Index), we find that the eight authors with the greatest number of publications are the same individuals with the greatest number of original articles. This reflects significant contributions to the field of cutaneous surgery by these authors. This analysis further identifies source papers for authors in Dermatologic Surgery. Publications frequently cited include those papers discussing laser surgery, with Dermatologic Surgery serving as the most frequently cited journal.

Keywords: Articles, Authors, Citation, Citations, Database, Institute for Scientific Information, Journal, Journals, Literature, Medical, Medical Literature, Number of Publications, Publications, Science, Science Citation Index, Surgery, Topics

# Title: Dermatology

Full Journal Title: [Dermatology](http://content.karger.com/ProdukteDB/produkte.asp?Aktion=JournalHome&ProduktNr=224164)

ISO Abbreviated Title: Dermatology

JCR Abbreviated Title: Dermatology

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories

: Impact Factor

? Didierjean, X. (2002), “Editors! - Check your impact factor data!”. *Dermatology*, **205** (4), 327-328.

Full Text: [2002\Dermatology205, 327.pdf](2002/Dermatology205,%20327.pdf)

Keywords: Impact, Impact Factor

# Title: Desalination

Full Journal Title: [Desalination](http://www.sciencedirect.com/science?_ob=PublicationURL&_cdi=5238&_pubType=J&_auth=y&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=8a7bc4bb5ca9a8e93207dd0ca2a936c9)

ISO Abbreviated Title: Desalination

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Journal Country/Territory: Netherlands

Language: English

Publisher: Elsevier Science BV

Publisher Address: PO Box 211, 1000 AE Amsterdam, Netherlands

Subject Categories:

Engineering, Chemical: Impact Factor 0.434, 62/110 (1999), Impact Factor 0.658, 48/123 (2001), Impact Factor 0.517, 62/126 (2002), Impact Factor 0.694, 48/119 (2003), Impact Factor 1.057, 34/116 (2004); Impact Factor 0.955, 45/116 (2005); Impact Factor 0.875, 51/114 (2007); Impact Factor 1.155, 42/116 (2008); Impact Factor 2.034, 28/126 (2009)

Water Resources: Impact Factor 0.518, 28/47 (2000), Impact Factor 0.658, 22/50 (2001), Impact Factor 0.517, 30/53 (2002), Impact Factor 0.694, 26/55 (2003), Impact Factor 1.057, 15/55 (2004); Impact Factor 0.955, 26/57 (2005); Impact Factor 0.875, 37/59 (2007); Impact Factor 1.155, 26/60 (2008); Impact Factor 2.034, 6/66 (2009)

Urano, K. (1986), Water reuse with granular activated carbon. *Desalination*, **23** (1-3), 533-540.

Full Text: [D\Desalination23, 533.pdf](D/Desalination23,%20533.pdf)

Abstract: Carbon adsorption process has become a feasible and reliable process for reuse of wastewater. This paper discribes the present status and some topics of granular activated carbon, water reuse processes with it and regeneration technics of spent carbon in Japan. Japanese activated carbon for water treatment had been improved and become good performance. There are about 200 plants of wastewater treatment with granular activated carbon in Japan. The 50,000 m3/day domestic wastewater reclamation plant is under constraction, and the 30,000 m3/day industrial wastewater reclamation plant is satisfactorily operated. Many types of furnaces not only multihearth furnace but also moving bed furnace and two stages rotary kiln are developed for regeneration of spent carbon.

Hanmin, Z. and Ruowen, F. (1986), The adsorption characteristics for the various metal ions in aqueous solutions using activated carbon fiber. *Desalination*, **58** (2), 169-170.

Full Text: [D\Desalination58, 169.pdf](D/Desalination58,%20169.pdf)

? Adhikary, S.K., Tipnis, U.K., Harkare, W.P. and Govindan, K.P. (1989), Defluoridation during desalination of brackish water by electrodialysis. *Desalination*, **71** (3), 301-312.

Full Text: [1989\Desalination71, 301.pdf](1989/Desalination71,%20301.pdf)

Abstract: Studies have been conducted to defluoridate brackish water containing 2120, 3020, 4260 and 4800 ppm total dissolved solids (TDS) and 5, 10, 15 and 20 ppm fluoride by means of electrodialysis. A Laboratory electrodialysis stack containing 15 cell pairs of cation-and anion-exchange membranes of 80 cm2 effective cross-sectional area is used. Data have been collected under different flow rates and current densities. Optimum operational conditions have been determined for obtaining product water containing 600 ppm TDS and 1.5 ppm fluoride, which is acceptable for use as potable water. Brackish waters up to 5000 ppm TDS containing fluoride up to 15 ppm can be reduced to ca. 600 ppm TDS and 1.5 ppm fluoride. This approach is found suitable for desalination and defluoridation of water having TDS up to 5000 ppm and fluoride up to 10 ppm with an energy requirement of <1 kWh/kg of salt removed.

Keywords: Brackish Water, Defluoridation, Desalination, Electrodialysis

Pansint, M. and Colella, C. (1990), Dynamic data on lead uptake from water by chabazite. *Desalination*, **78** (2), 287-295.

Full Text: [D\Desalination78, 287.pdf](D/Desalination78,%20287.pdf)

Abstract: The possibility of using chabazite, a natural zeolite exchanger, for lead removal from water is examined, testing fixed beds made of Campanian tuff, a volcanic rock rich in such zeolite.

Lead breakthrough curves, as a function of pollutant concentration and influent flow rate, are determined and dynamic parameters connected with ion exchange operation calculated.

The considerable selectivity of chabazite for lead and the good performances of the beds in the process investigated are emphasized, obtaining also useful indications on the operating conditions under which such processes should be carried out.

Jeppesen, B. (1996), Domestic greywater re-use: Australia’s challenge for the future. *Desalination*, **106** (1-3), 311-315.

Full Text: [D\Desalination106, 311.pdf](D/Desalination106,%20311.pdf)

Abstract: Under a grant from the Urban Water Research Association of Australia, the Brisbane City Council has advanced Australian research into domestic greywater re-use. This hard work has established that domestic greywater does contain chemicals and microorganisms that can be harmful to public health and the environment. Greywater can even emit noxious odours. However, if domestic greywater could be re-used to water lawns and ornamental gardens, the average household potable water usage could be reduced by between 30-50%. Public acceptance of the principle is high, but this must be balanced against the incorrect perception that greywater is innocuous. The challenge now facing Australian Water Authorities is how to fully utilize this valuable resource without: compromising public health, causing detrimental impact to the environment or down grading the livability of our residential areas. Only through total management and public awareness of the issues is this possible. To help achieve these goals the Brisbane City Council is presently developing guidelines for the application of domestic grey, vater re-use for sewered areas in Australia. This paper provides a brief overview of this research and atl insight into the direction of these proposed guidelines.

Anderson, J.M. (1996), A possible regulatory framework for water recycling in Australia. *Desalination*, **106** (1-3), 331-333.

Full Text: [D\Desalination106, 331.pdf](D/Desalination106,%20331.pdf)

Abstract: Different regulatory frameworks for water recycling have evolved in each state in Australia. This paper discusses the features and weaknesses of the existing regulatory framework. A uniform national approach is proposed.

Keywords: Water Recycling

Fabiani, C., Ruscio, F., Spadoni, M. and Pizzichini, M. (1997), Chromium(III) salts recovery process from tannery wastewaters. *Desalination*, **108** (1-3), 183-191.

Full Text: [D\Desalination108, 183.pdf](D/Desalination108,%20183.pdf)

Abstract: Chromium(III) salts are the most widely used chemicals for tanning processes [1], but only 60% of the total chromium salt reacts with the hides. Therefore, about 40% of the chromium amount remains in the solid and liquid wastes (especially spent tanning solutions). The presence of chromium(III) and salts in the sludges of both the wastewater biological treatment plants or the chemical plants for recycling spent tanning liquors, represents an inconvenience for the safe reuse of these sludges and a cost forming factor for their disposal. Among the several proposed methods for chromium recovery [1-6], lime or sodium hydroxide precipitation and filter-pressing of the chromium hydroxide is the usual way to recover chromium salts from spent process solutions or from leaching solutions of residues of hides. However, usually the chromium salts quality must be improved for their reuse in tanning processes [7]. The integration of membranes in the treatment process for chromium recovery reduces the environmental impact, favours the reuse of both the protein residue and the biological plant sludges, reduces the consumption of chemicals and decreases the costs of waste disposal.

Keywords: Aqueous-Solutions, Adsorption, Chromium Recovery, Tanning Processes, Microfiltration, Ultrafiltration

Doyen, W. (1997), Latest developments in ultrafiltration for large-scale drinking water applications. *Desalination*, **113** (2-3), 165-177.

Full Text: [D\Desalination113, 165.pdf](D/Desalination113,%20165.pdf)

Abstract: In view of the implementation of ultrafiltration for large-scale drinking water applications, the properties of the membranes, the types of modules and the mode of operation had to be reviewed. In this respect the surface porosity and adsorption characteristics of the membranes were improved, module sizes were adapted, and the semi-dead operational mode was pioneered. Thus treatment costs could be lowered to about DM 0.2-0.4/m3 of treated permeate. This makes ultrafiltration a very promising unit operation for the next century. In this paper the most recent large-scale applications of the players in this field will be discussed.

Keywords: Membranes, Ultrafiltration, Drinking Water, Membrane, Module

? Morawski, A.W. and Inagaki, M. (1997), Application of modified synthetic carbon for adsorption of trihalomethanes (THMs) from water. *Desalination*, **114** (1), 23-27.

Full Text: [1997\Desalination114, 23.pdf](1997/Desalination114,%2023.pdf)

Abstract: The synthetic carbon spheres derived from phenol resin (APT, APT-P and GP-30) were used for water purification from trihalomethanes (THMs). All samples as prepared were inactive in adsorption of THMs from water solution, Presented chemical modification of carbon spheres by nitric acid permits us to obtain a useful carbon adsorption material, in which the chemical character of the surface is drastically changed by the aforementioned treatment. The resulting THMs adsorption data indicate a new environmental application of the modified synthetic carbons. APT carbon has a good future for an application as a powdered activated carbon (PAC), whereas APT-P might be used as a granular activated carbon (GAG) or shaped hard carbon material of different equipment for removal of THMs from drinking water.

Keywords: Activated Carbon, Adsorption, Carbon, Chemical, Chemical Modification, Drinking Water, Environmental, Modification, Nitric Acid, Phenol, Powdered Activated Carbon, Purification, Synthetic Carbon, Synthetic Carbons for Thms Adsorption, Treatment, Water, Water Purification from THMs

Lounici, H., Addour, L., Belhocine, D., Grib, H., Nicolas, S., Bariou, B. and Mameri, N. (1997), Study of a new technique for fluoride removal from water. *Desalination*, **114** (3), 241-251.

Full Text: [D\Desalination114, 241.pdf](D/Desalination114,%20241.pdf)

Abstract: A new technique based on the combination of an activated alumina column and an electrochemical system for fluoride removal from water is reported in this study. In the first step, the optimization of the process was achieved under various experimental parameters (volumetric flow, temperature, pH, initial fluoride concentration and hardness) with a synthetic solution. The comparison of the performance of the current activated alumina process and the electrosorption system proved to be more efficient than the latter in removing fluoride from water. Thus, the fluoride sorption capacity at the breakthrough point of the activated alumina column reached 3.8 mg F-/L. It was increased by about 60% by means of the electrochemical process than the results obtained in current mode. Moreover, it was found that the electrosorption system could be utilized to regenerate the saturated activated alumina. In the second step, the electrosorption process was utilized to treat Sahara drinking water naturally contaminated with fluoride (3 mg/L) under optimum conditions previously determined. The electrosorption process coupled with activated alumina column has been successfully applied for fluoride removal from drinking water.

Keywords: Electrosorption, Fluoride, Activated Alumina, Optimization, Drinking Water, Treatment, Column, Ions

? Morawski, A.W. and Inagaki, M. (1998), Application of modified synthetic carbon for adsorption of trihalomethanes (THMs) from water (vol 114, pg 26, 1997). *Desalination*, **115** (1), 108.

Full Text: [1998\Desalination115, 108.pdf](1998/Desalination115,%20108.pdf)

Keywords: Adsorption, Carbon, Synthetic Carbon, Water

Grebenyuk, V.D., Verbich, S.V., Linkov, N.A. and Linkov, V.M. (1998), Adsorption of heavy metal ions by aminocarboxyl ion exchanger ANKB-35. *Desalination*, **115** (3), 239-254.

Full Text: [D\Desalination115, 239.pdf](D/Desalination115,%20239.pdf)

Abstract: Selectivity of polyampholyte ANKB-35 for Ni, Cu, Zn and Cd ions was studied. The exchange capacity of the resin did not depend on concentration of counterions in dilute solutions. Parameters of ion adsorption from highly concentrated solutions such as pH, concentration and flow rates of solutions were established in order to determine regeneration conditions of the resin. The influence of the size of polyampholyte granules on adsorption efficiency was studied. After calculation of ion diffusion coefficients in resin samples with different granule radii it became apparent that the rate of ion exchange in the resin was limited by diffusion in gel phase. Change in solution pH and deformation of polymer chains of the resin during cation adsorption led to variation in moisture content and change in the water state in it. These parameters were quantified based on endotherms of ice melting in the resin.

Keywords: Ion-Exchange Resin, Heavy Metal Ions, Adsorption, Sorption, Kinetics, Water

Lebeau, T., Lelievre, C., Buisson, H., Cleret, D., Van de Venter, L.W. and Cote, P. (1998), Immersed membrane filtration for the production of drinking water: combination with PAC for NOM and SOCs removal. *Desalination*, **117** (1-3), 219-231.

Full Text: [D\Desalination119, 219.pdf](D/Desalination119,%20219.pdf)

Abstract: The use of microfiltration (MF) or ultrafiltration (UF) processes is expanding rapidly as an alternative to conventional clarification and filtration processes to meet increasingly stringent regulations related to the treated water quality and in particular to pathogens such as Giardia and Cryptosporidium. The membranes used in these processes do not remove color, natural organic matter (NOM) or synthetic organic chemicals (SOCs). MF and UF must be combined with other conventional technologies such as activated carbon adsorption and coagulation to overcome some of these limitations. In this context recent advances in immersed membranes configurations offer an opportunity to develop new combined treatment processes. In most of these systems, shell-less hollow fiber membranes are directly immersed in the reaction vessel receiving the water to be purified and operated under slight negative pressure (whereas they are traditionally housed in pressure vessels in conventional MF and UF systems). The membranes represent a positive barrier between a “reaction zone” where adsorption, biodegradation or coagulation can be carried out and the water treated. The system offers a great flexibility of operation by allowing operation at high suspended solids concentrations and to adapt the type and age of the suspension to the required treatment. The association of immersed membranes and powdered activated carbon provides the following benefits: (1) better physical removal of NOM and SOCs through optimal use of PAC, (2) biological removal of the biodegradable fraction of NOM, (3) reduced sludge volumes, and (4) absolute containment of the PAC within the system independent of process conditions. The very high concentration of PAC (10-20 g/L) carried in the reactor offers the required buffer capacity. The present research program, carried out at Compagnie Generale des Eaux Research Laboratory (in Maisons-Laffitte, France), has examined the use of immersed membranes for significantly enhancing SOCs and NOM removal at bench and pilot scales. An onsite pilot-study was conducted in Granville (Normandie) over one year to evaluate the immersed membrane process on river water. The process was first evaluated as a polishing microfiltration/PAC slurry reactor, after conventional coagulation/flocculation and sedimentation. In a second phase, the process was directly used on raw water with in-line coagulation, in that case, the coagulated matter and the PAC were allowed to co-exist in the membrane tank. The results of these studies show that the combination of immersed membranes with PAC and/or coagulant provides (1) excellent water quality through significant enhancement of particulate matters as well as NOM and SOCs removal, (2) excellent response to variations of the feed water quality and (3) suitability for plant upgrading by conversion of existing clarifiers or sand filters into membrane reactors.

Keywords: Microfiltration, Immersed Membranes, NOM and SOCs Removal, PAC Slurry, Coagulant, Plant Retrofitting

Ma, W.T., Sun, Z.C., Wang, Z.X., Feng, Y.B., Wang, T.C., Chan, U.S., Miu, C.H. and Zhu, S.C. (1998), Application of membrane technology for drinking water. *Desalination*, **119** (1-3), 127-131.

Full Text: [D\Desalination119, 127.pdf](D/Desalination119,%20127.pdf)

Abstract: In order to provide high-quality drinking water to the residents, Daqing City started the High-Quality Water Supply Project in 1994. In the first phase, seven polishing water treatment systems consisting of preozonation, microfiltration (MF), activated carbon (AC) adsorption, ultrafiltration (UF) or reverse osmosis (RO) and postozonation were installed in various residential districts. The existing low-quality tap water is used as feed water, and the treated water is distributed to the customers through an independent network or with bottles for drinking and cooking purposes. The total treatment capacity of the seven systems is 620 m3/d. The seven systems were commissioned separately from September to November 1997 and have been running smoothly. The performance of the systems meets the design requirements, and the treated water quality meets the European Union Drinking Water Standard. Economically, both capital investment and operating costs are within the initial budgets and at rational levels.

Keywords: Membrane, Ultrafiltration, Microfiltration, Ozonation, Activated Carbon

Amor, Z., Malki, S., Taky, M., Bariou, B., Mameri, N. and Elmidaoui, A. (1998), Optimization of fluoride removal from brackish water by electrodialysis. *Desalination*, **120** (3), 263-271.

Full Text: [D\Desalination120, 263.pdf](D/Desalination120,%20263.pdf)

Abstract: The study showed that desired potable water can be easily obtained by electrodialysis from fluoride-rich brackish water. Studies have been performed to defluoridate brackish water containing 3000 ppm of total dissolved solids (TDS) and 3 ppm of fluoride using electrodialysis. The behaviour of water parameters (ion contents, TDS, pH, total hardness) with electrodialysis parameters (duration, now rate, temperature, voltages) is followed. Optimal operational conditions for obtaining desired potable water have been proposed.

Keywords: Ion-Exchange Membrane, Defluoridation, Electrodialysis, Defluoridation

Hichour, M., Persin, F., Molénat, J., Sandeaux, J. and Gavach, C. (1999), Fluoride removal from diluted solutions by Donnan dialysis with anion-exchange membranes. *Desalination*, **122** (1), 53-62.

Full Text: [D\Desalination122, 53.pdf](D/Desalination122,%2053.pdf)

Abstract: Too many or too few fluoride ions in drinking water are harmful to the consumer’s health. The acceptable fluoride concentration is generally in the range of 0.5 to 1.5 mg.L-1. In the present study, Donnan dialysis (DD) with an anion-exchange membrane (AEM) was applied for the defluoridation of diluted NaF solutions. The initial concentration of the feed solution was maintained at 10-3 mol.L-1, corresponding to a 19 mg.L-1 fluoride concentration. Five kinds of AEMs (DSV, AFX, AFN, AMX, ACS) were tested. First, membrane properties were studied at equilibrium. The values of the exchange capacity of the membranes in Cl- and F- form, water content, selectivity coefficient for the Cl-/F- exchange, diffusion coefficient of Cl- and F- ions in the membrane, were determined for each membrane. DD experiments, performed using a laboratory cell, showed that the DSV membrane is the most effective AEM, despite its electrolyte leakage. Subsequently, a pre-industrial pilot with a total membrane area of 1760 cm2 was used to study the different physico-chemical and hydrodynamic parameters of the process. As the driving ion, the chloride ion is more efficient than the sulfate ion. At flow rates lower than 0.6 L.h-1, the fluoride concentration remains lower than the permitted values despite the presence of others anions generally present in ground water such as chloride, sulfate and bicarbonate ions.

Keywords: Fluoride Ion, Donnon Dialysis, Anion-Exchange Membrane, Defluoridation, Diluted Solution, Transport-Properties, Water, Defluoridation, Enrichment, Ash

Marques, P.A., Pinheiro, H.M., Teixeira, J.A. and Rosa, M.F. (1999), Removal efficiency of Cu2+, Cd2+, Pb2+ by waste brewery biomass: pH and cation association effects. *Desalination*, **124** (1-3), 137-144.

Full Text: [D\Desalination124, 137.pdf](D/Desalination124,%20137.pdf)

Abstract: In this work two distinct (flocculent and non-flocculent) yeast wastes from Portuguese breweries were used for the selective removal of Cu2+, Cd2+ and Pb2+ from aqueous solutions. One of the goals was to establish both the pH pro files for the removal of each metal ion (1.0 mM) and the effect on the biomass biosorption capacity of pH adjustment during the process. The effect of the presence of multiple metal ions, in the 0.1-1.0 mM range, on metal removal efficiency was also studied. The results showed that, in the absence of pH adjustment, the optimum initial pH for the removal of three cations was in the 4.5-5.5 range for both types of biomass. However, a gradual pH increase was observed during the removal process, up to a final equilibrium value of 7.0-8.0. Regarding the biomass efficiency for metal removal in multi-cation systems, it was verified that only Cu2+ was significantly affected by the presence of the other metals in solution and only when the non-flocculent yeast biomass was used as biosorbent. Cd2+ was only slightly affected by the presence of both Cu2+ and Pb2+, and Pb2+ removal was not affected by the presence of any or both of the interferent metals for the two biosorbents used in this work. The highest and lowest metal removal yields were obtained for Pb2+ and Cu2+, respectively.

Keywords: Biosorption, Multiple-Cation Systems, Cadmium, Copper, Lead, Non-Viable Yeast Biomass, pH, Heavy-Metal Biosorption, Ions

? Padilla, A.P. and Tavani, E.L. (1999), Treatment of an industrial effluent by reverse osmosis. *Desalination*, **126** (1-3), 219-226.

Full Text: [1999\Desalination126, 219.pdf](1999/Desalination126,%20219.pdf)

Abstract: The treatment of tanning wastewater was studied by means of reverse osmosis and ultrafiltration. Tests were carried out on laboratory scale using membranes of polyamide (reverse osmosis) and of polysulfone (ultrafiltration). The evaluation of the system was performed by chemical analysis, pH measurements and visible spectrophotometry. Effects of the protein contained in the industrial effluent, the applied pressure and the feed temperature on the permeate flux were analyzed. The polyamide membrane used allowed us to obtain permeates with a low chromium(III) content (7-10 mg/L) but with appreciable amounts of SO4- (1-3 g/l), Cl- (9-14 g/L) and Na+ (5-10 g/L). The presence of chromium(III) polymers was determined in the original effluent and in the concentrates obtained by reverse osmosis. Finally, it was established that during the operation of reverse osmosis, the transport of H+ (H3O+) from the concentrate to the permeate was produced.

Keywords: Tanning Wastewater, Reverse Osmosis, Ultrafiltration, Chromium(III), Recovery, Leather, Hydrolytic Polymerization, Aqueous-Solution, Waste-Water, Chromium(III), Tannery, Disposal

? Padilla, A.P. and Tavani, E.L. (1999), Treatment of an industrial effluent by reverse osmosis. *Desalination*, **126** (1-3), 219-226.

Full Text: [1999\Desalination126, 219.pdf](1999/Desalination126,%20219.pdf)

Abstract: The treatment of tanning wastewater was studied by means of reverse osmosis and ultrafiltration. Tests were carried out on laboratory scale using membranes of polyamide (reverse osmosis) and of polysulfone (ultrafiltration). The evaluation of the system was performed by chemical analysis, pH measurements and visible spectrophotometry. Effects of the protein contained in the industrial effluent, the applied pressure and the feed temperature on the permeate flux were analyzed. The polyamide membrane used allowed us to obtain permeates with a low chromium(III) content (7-10 mg/L) but with appreciable amounts of SO4- (1-3 g/l), Cl- (9-14 g/L) and Na+ (5-10 g/L). The presence of chromium(III) polymers was determined in the original effluent and in the concentrates obtained by reverse osmosis. Finally, it was established that during the operation of reverse osmosis, the transport of H+ (H3O+) from the concentrate to the permeate was produced.

Keywords: Tanning Wastewater, Reverse Osmosis, Ultrafiltration, Chromium(III), Recovery, Leather, Hydrolytic Polymerization, Aqueous-Solution, Waste-Water, Chromium(III), Tannery, Disposal

Pervov, A.G., Dudkin, E.V., Sidorenko, O.A., Antipov, V.V., Khakhanov, S.A. and Makarov, R.I. (2000), RO and NF membrane systems for drinking water production and their maintenance techniques. *Desalination*, **132** (1-3), 315-321.

Full Text: [D\Desalination132, 315.pdf](D/Desalination132,%20315.pdf)

Abstract: Elaboration of drinking water supply strategies is closely connected with expansion of private housing, as well as country farms and industries that require water treatment facilities. As a rule, the majority of ground well waters does not meet modern drinking standards due to high content of iron, hardness, strontium, nitrates, fluoride and TDS. Thus, a special respect should be given to small portable and economically reasonable point-of-entry water treatment systems that produce quality water meeting WHO standards. Membrane treatment techniques are based on simultaneous rejection of all types of ionic and molecular water species by semipermeable (RO) polymeric membranes which is more advantageous compared to conventional treatment techniques. The continuous theoretical and experimental research conducted in VODGEO research institute from 1992 to 1999 resulted in development of drinking water production techniques from different natural waters, using Russian-made and foreign polymeric membranes. Computer calculation techniques are developed that enable us to determine optimum characteristics of membrane water treatment systems, such as pressure, recovery, membrane type etc, corresponding to optimum quality water composition (required hardness, fluoride, chloride and TDS content). As a result, water purification techniques were developed providing facilities with operational guidelines to reduce greatly membrane fouling and simplify pretreatment. This demonstrates considerable cost savings and membrane efficiency compared to conventional iron removal and ion exchange softening techniques.

Keywords: Nanofiltration, Membrane Systems, Product Concentration, Rejection, Concentration Ratio, Computer Calculation, Operational Guidelines

? Marcucci, M., Nosenzo, G., Capannelli, G., Ciabatti, I., Corrieri, D. and Ciardelli, G. (2001), Treatment and reuse of textile effluents based on new ultrafiltration and other membrane technologies. *Desalination*, **138** (1-3), 75-82.

Full Text: [2001\Desalination138, 75.pdf](2001/Desalination138,%2075.pdf)

Abstract: Different membrane processes were experimented on at pilot scale to verify the possibility of reusing textile wastewater. The pilot plant used sand filtration and ultrafiltration (UF) as pre-treatments for a membrane process of nanofiltration (NF) or reverse osmosis (RO). UF was obtained by the installation of an innovative module designed on flat membranes operating under vacuum; the configuration of the NF and RO membranes was spiral wound. The efficiency of the various treatments in removing pollutants from textile wastewater from an activated sludge plant was tested on the reduced scale to optimize the industrial plant design. The UF module tested works at low operating pressure (that involves low energy costs) and guarantees a constant permeate (feed of the next membrane process of NF or RO). The RO permeate can be reused in the dyeing processes as demonstrated by many yam dyeing tests on the industrial scale. NF does not reach the retention behaviour of RO (total hardness removal of 75% and > 90% for NF and RO respectively). Nevertheless, a change in the freshwater treatment (at present an ion-exchange resin softening) downstream from the use of process water in the factory would decrease the secondary effluent salinity, so the design of the advanced purification industrial plant could reasonably foresee a NF treatment instead of RO, allowing a reduction of the costs.

Keywords: Flat-Membrane Ultrafiltration, Nanofiltration, Reverse Osmosis, Textile Wastewater, Colour Removal, Water Reuse, Waste-Water Treatment

Kurihara, M., Yamamura, H., Nakanishi, T. and Jinno, S. (2001), Operation and reliability of very high-recovery seawater desalination technologies by brine conversion two-stage RO desalination system. *Desalination*, **138** (1-3), 191-199.

Full Text: [D\Desalination138, 191.pdf](D/Desalination138,%20191.pdf)

Abstract: A reverse osmosis (RO) seawater desalination system has many advantages such as saving energy and using less installation space, and has become regular technology to obtain fresh water from seawater. A significant way to lower energy and installation space is to raise system recovery, and we have developed anew RO seawater desalination system which provides 60% recovery of fresh water for 3.5% seawater. The new technology is called a brine conversion two-stage SWRO system (BCS). This system includes several new technologies such as system configuration, energy recovery, operating condition, etc., high-performance membrane technology, anti-biofouling technology and a new analysis method. A pilot plant has been operated successfully at Toray’s Ehime plant site since 1997. The first commercial plant of 4500 m3/d (1.2mgd) has been operating successfully since March 1999 in Mas Palomas (Gran Canaria, Spain). The Tortola and Curacao plants in the Caribbean have been installed with the fall BCS (first- + second-stage RO system), and also operated under good conditions. A new application of the BCS, installed at the Muroto plant in Japan, has been in operation to obtain bottled drinking water and high concentrated mineralized water from deep seawater. Furthermore, other plants are under construction in Spain and the Caribbean. The BCS is presumed to be the standard SWRO system for the 21st century.

Keywords: Seawater Desalination, Higher Recovery, BCS, Saving Energy, High-Performance Membrane, Anti-Biofouling, Membranes

Al-Jayyousi, O.R. and Mohsen, M.S. (2001), Evaluation of small home-use reverse osmosis units in Jordan. *Desalination*, **139** (1-3), 237-247.

Full Text: [D\Desalination139, 237.pdf](D/Desalination139,%20237.pdf)

Abstract: This paper aims to evaluate the water quality of domestic RO units used in Jordan along with bottled and tap water. Analyses of the quality of water sources (RO, bottled and tap) and water cost are carried out. The methodology of this research is based on both lab experimental analysis and field survey of several RO units. It was concluded that all samples from the three sources are in compliance with Jordanian Standards. However, one type of bottled water and RO produced water are below the allowable limits with regard to all chemical properties. Tap water exceeds the allowable limit with regards to both total hardness and TDS, but is still below the allowable limits in case no better resource is available. However, with regard to pH and chloride concentrations, tap water is below the allowable limits. Based on quality and cost, it was found that RO produced water provides water within the allowable limits with a relatively reasonable price.

Keywords: Reverse Osmosis, Jordan, Water Quality, Bottled Water, Microbiological Quality, Water

? Chauhan, G.S., Guleria, L.K. and Mahajan, S. (2001), A study in sorption of some metal ions on novel hydrogels based on modified cellulosics and 2-acrylamido-2-methyl propane sulphonic acid. *Desalination*, **141** (3), 325-329.

Full Text: [2001\Desalination141, 325.pdf](2001/Desalination141,%20325.pdf)

Abstract: New polymeric backbones were synthesized from cellulose extracted from pi-ne needles, a renewable resource of the Western Himalayas. Conditions for optimum network yield were evaluated as a function of irradiation dose, concentrations of monomer and crosslinker and amount of water for interpenetrating networks (IPNs) of hydroxypropyl cellulose (HPC) with 2-acrylamido-2-methyl propanesulphonic acid (AAmPSA). N, N-methylene bisacrylamide was used as crosslinker. At optimum conditions thus evaluated, IPNs of cellulose and other cellulosics like cyano-ethylcellulose, hydroxyethylcellulose, hydrazinodeoxycellulose and cellulosephosphate were synthesized. These hydrogels were used in sorption of Fe2+, Cu2+ and Cr6+ metal ions. The results of ion sorption as partitioning of ions between polymeric matrices and liquid phase are reflected in high values of partition coefficients for Fe2+ and Cu2+.

Keywords: 2-Acrylamido-2-Methyl Propanesulphonic Acid, Cellulose, Cellulosics, Cr6+, Cu2+, Hydrogels, Hydroxypropylcellulose, Interpenetrating Networks, Ion, Ipns, Irradiation, Partition, Partition Coefficients, Partitioning, Pine, Pine Needles, Polymeric, Polymeric Matrices, Retention Capacity, Sorption, Water, Yield

? Benito, Y. and Ruíz, M.L. (2002), Reverse osmosis applied to metal finishing wastewater. *Desalination*, **142** (3), 229-234.

Full Text: [2002\Desalination142, 229.pdf](2002/Desalination142,%20229.pdf)

Abstract: The electroplating industry is a great water consumer and, as a consequence, one of the biggest producers of liquid effluent. The metal finishing industry presents one of the most critical industrial waste problems. There is therefore growing interest in developing methods for reclaiming metals from plating waste stream and recovery of water using membrane technology [1,2]. The application of reverse osmosis (RO) to the global effluent from the electroplating industry has been studied in this paper. The results obtained show that there is 75-95% recovery of water and nearly total removal of metals in the permeate.

Keywords: Reverse Osmosis, Electroplating Wastewater, Pilot Plant, Membrane

de Lint, W.B.S., Benes, N.E., Higler, A.R. and Verweij, H. (2002), Derivation of adsorption parameters for nanofiltration membranes using a 1-pK Basic Stern model. *Desalination*, **145** (1-3), 87-95.

Full Text: [D\Desalination145, 87.pdf](D/Desalination145,%2087.pdf)

Abstract: The ion retention and flux of nanofiltration (NF) membranes are to a large extent determined by the membrane surface charge. This surface charge is in turn strongly influenced by adsorption of ions from the solution onto the membrane material. A 1-pK adsorption model with a Basic Stern electrostatic double layer model is used to describe ion adsorption, and the sensitivity of this model for various parameters is discussed. From a non-linear regression analysis of literature data [1, 2] regarding the surface charge and the zeta-potential, adsorption parameters for the I pK model are obtained for sodium chloride on gamma-alumina. The 1-pK Basic Stern model could predict the surface charge well, except for the highest concentration of 1000 mol/m3. Reasonable agreement is found between the measured zeta-potentials and the model predictions.

Keywords: Specific Adsorption, Nanofiltration Membranes, Zeta-Potential, Surface Charge, Gamma-Alumina, Electrical Double-Layer, Multicomponent Electrolyte-Solutions, Solid-Solution Interface, Oxide-Water Interface, Surface-Ionization, Reverse-Osmosis, (Hydr)Oxides, Alumina, Charge, Ions

Han, B.B., Runnells, T., Zimbron, J. and Wickramasinghe, R. (2002), Arsenic removal from drinking water by flocculation and microfiltration. *Desalination*, **145** (1-3), 293-298.

Full Text: [D\Desalination145, 293.pdf](D/Desalination145,%20293.pdf)

Abstract: Arsenic removal from drinking water is a major problem in many parts of the world. We have investigated arsenic removal by flocculation and microfiltration. Ferric chloride and ferric sulphate have been used as flocculants. The use of small amounts of cationic polymeric flocculants, as flocculation aids in the presence of ferric ions, has also been investigated. The results obtained here show that flocculation prior to microfiltration leads to significant arsenic removal in the permeate. Further, the addition of small amounts of cationic polymeric flocculants lead to significantly improved permeate fluxes during microfiltration. The residual turbidity, after flocculation and microfiltration, may be used as a guide to the level of arsenic removal. Since energy requirements for microfiltration are low and fluxes high, compared to other membrane processes such as reverse osmosis and nanofiltration, flocculation and microfiltration may be a cost effective method for arsenic removal from drinking water.

Keywords: Arsenic, Cationic Flocculant, Drinking Water, Ferric Ions, Flocculation, Microfiltration, Adsorption, Ferrihydrite

? Kim, D.S., Kang, J.S., Kim, K.Y. and Lee, Y.M. (2002), Surface modification of a poly(vinyl chloride) membrane by UV irradiation for reduction in sludge adsorption. *Desalination*, **146** (1-3), 301-305.

Full Text: [2002\Desalination146, 301.pdf](2002/Desalination146,%20301.pdf)

Abstract: N-vinyl-2-pyrroldinone was grafted by the UV-irradiation process onto the porous surface of poly(vinyl chloride) (PVC) membrane to increase the surface wettability and to decrease the adsorptive fouling. The graft yield of the modified PVC membrane was maximum at 5 min UV exposure time and 20 wt% aqueous NVP solution. The specific resistance (alpha(c)) of the adsorbed cake layer decreased with the increase of the grafting degree of NVP. In the dead-end filtration performances of membranes, although the mutual repulsive interaction between sludge and the surface of the PVC-g-PNVP membrane was weak with the increase of the grafting degree, the low adsorption of sludge with the increase of NVP grafting was affected by the contribution of the higher hydrophilicity due to grafting NVP rather than by the contribution of interaction between sludge and the membrane surface.

Keywords: Activated Sludge, Adsorption, Chloride, Exposure, Filtration, Fouling, Grafting, Interaction, Irradiation, Membrane, Membranes, Modification, N-Vinyl-Pyrrolidinone (NVP), Poly(Vinylchloride), Porous, PVC, Reduction, Resistance, Sludge, Specific Resistance, UV, UV Irradiation, UV-Irradiation, Wettability, Yield

? Minhalma, M. and de Pinho, M.N. (2002), Development of nanofiltration/steam stripping sequence for coke plant wastewater treatment. *Desalination*, **149** (1-3), 95-100.

Full Text: [2002\Desalination149, 95.pdf](2002/Desalination149,%2095.pdf)

Abstract: The present work proposes the optimisation of an integrated process that consists in the coupling of Nanofiltration (NF) with Steam Stripping for the treatment of ammoniacal wastewaters contaminated by cyanides ions and phenols. These wastewaters are fractionated by NF into an ammonium concentrate and an ion-containing permeate stream. The concentrates are further fractionated in the steam stripping column. The NF experiments were performed with a DSS plate and frame Lab-Unit 20, equipped with a HR-98-PP membrane. The NF experiments were run in concentration mode to optimise the concentrate ammonium content/permeate flux as a function of water recovery ratio (RR). The optimisation of the NF/steam stripping integrated process was carried out with a sequential process simulator. The optimisation study showed that the NF should work at a recovery ratio of 40%. At this RR the ammonium can be efficiently concentrated and purified from cyanides at reasonable permeate flowrates. The column steam consumption was also optimised as a function of the NF concentrates flowrate. The integrated process leads to an increase of the stripping efficiency and to significant energy savings (0.698 EURO/m3 treated water).

Keywords: Ammonia Removal, Ammoniacal Wastewater, Coke Plant Wastewater, Coke Plants, Cyanides, Ion-Exchange, Nanofiltration, Phenols, Steam Stripping, Wastewater, Water, Zeolite

? Velizarov, S., Reis, M.A. and Crespo, J.G. (2002), Integrated transport and reaction in an ion exchange membrane bioreactor. *Desalination*, **149** (1-3), 205-210.

Full Text: [2002\Desalination149, 205.pdf](2002/Desalination149,%20205.pdf)

Abstract: The removal of low molecular mass charged compounds from water streams in an ion exchange membrane bioreactor (IEMB) was studied. This integrated membrane process combines continuous ion exchange transport (Donnan dialysis) of the pollutant through a non-porous membrane, selective for the transport of mono-anions, and its simultaneous bioconversion to harmless products in a biocompartment. The mechanism of the process, governed by the Donnan equilibrium principles, allows for regulation of the direction and magnitude of flux of the individual anions present by adjusting the ratio of the impermeable co-ions between the biocompartment and polluted water compartment. Therefore, transport of a charged pollutant against its concentration gradient is possible. Experimental results, obtained for nitrate removal from drinking water are reported as a case study in order to evaluate the potential of the integrated process compared to that of other membrane-assisted bioprocesses as well as with Donnan dialysis operated as a single process. It was found that the IEMB process allows for the most selective removal of the target pollutant simultaneously avoiding microbial and secondary contamination of the treated water stream. The advantages, possible limitations and some recommendations for a successful IEMB process application are also briefly outlined.

Keywords: Charged Pollutants, Donnan Dialysis, Drinking Water, Drinking-Water Denitrification, Integrated Process, Ion Exchange, Ion Exchange Membrane Bioreactor, Nitrate Removal

Ucun, H., Bayhan, Y.K., Kaya, Y., Cakici, A. and Algur, O.F. (2003), Biosorption of lead(II) from aqueous solution by cone biomass of *Pinus sylvestris*. *Desalination*, **154** (3), 233-238.

Full Text: [D\Desalination145, 233.pdf](D/Desalination145,%20233.pdf)

Biosorption of lead(II) from aqueous solution by cone biomass of Pinus sylvestris  
Abstract: Biosorption of lead(II) onto a cone biomass of Pinus sylvestris was studied with variation in the parameters of pH, initial metal ion concentration and impeller speeds. Lead removal rate was increased at pH 4.0 and was sharply decreased when pH of the solution was decreased to 2.0. Impeller speed studies indicated maximum lead biosorption at 150 rpm and the biosorption equilibrium was established after about 1 h. The adsorption constants were found from the Freundlich isotherm at 25°C. An increase in lead/biomass ratio caused a decrease in biosorption efficiency. The cone biomass, which is a readily available biosorbent, was found suitable for removing of lead in aqueous solution.

Keywords: Biosorption, Lead, Heavy Metal, Wastewater Treatment, Cone Biomas, Pinus Sylvestris, Heavy-Metals, Removal

? Amara, M. and Kerdjoudj, H. (2003), Modification of cation-exchange membrane properties by electro-adsorption of polyethyleneimine. *Desalination*, **155** (1), 79-87.

Full Text: [2003\Desalination155, 79.pdf](2003/Desalination155,%2079.pdf)

Abstract: A cation-exchange membrane has been modified by fixation of polyethyleneimine on its surface. This fixation was carried out under an electric field effect, thus it is called electro-adsorption. The polycation formed in an acidic medium migrated toward the membrane and a charged layer was deposited on the surface, and the selectivity towards divalent ions decreased, yielding to the increase of the proton transfer. When the amount of adsorbed PEI increased, the electrical resistance of the membrane increased and the transport number of zinc decreased. However, suitable conditions like pH, current density and electro-adsorption time were controlled in the order to obtain membranes with better selectivity and low electrical resistance.

Keywords: Acid, Density, Electro-Adsorption, Electrodialysis, Membrane, Membranes, Metallic Divalent Salts, Pei, Permeability, Permselectivity, pH, Polyethyleneimine, Properties, Proton Transfer, Recovery, Resistance, Selectivity, Surface, Transport, Transport-Properties, Zinc

? Vaaramaa, K. and Lehto, J. (2003), Removal of metals and anions from drinking water by ion exchange. *Desalination*, **155** (2), 157-170.

Full Text: [2003\Desalination155, 157.pdf](2003/Desalination155,%20157.pdf)

Abstract: Five organic and two inorganic ion exchangers were evaluated for the removal of metals and anions from water of two drilled wells. Sodium titanate (CoTreat) and a chelating aminophosphonate resin were the most efficient exchangers in removing transition metals from the total of 1800 bed volumes processed, CoTreat was the best for almost all of the transition metals. The breakthrough level of manganese was below 1% with CoTreat even when its concentration in the feed water was high (1 mg/l). The weak acid cation resin took up transition metals relatively efficiently. Somewhat unexpectedly, the cation exchangers also removed arsenic from water. Arsenic may have been sorbed on iron species, which again was adsorbed and filtered by the exchanger beds. Most of the cation exchangers took up calcium and magnesium at low processing capacities (<400 BV), and the strong base anion resin took up nitrate, bromide and sulphate very efficiently below 700 bed volumes. Neither chloride nor fluoride was taken up by the exchangers tested.

Keywords: Ground Water, Purification, Ion Exchangers, Metals and Anions, Po-210, Pb-210

? Naceur, W.M., Messaoudene, N.A. and Aggoun, A. (2003), Microfiltration reinforced adsorption of humic acids onto modified Algerian clay. *Desalination*, **158** (1-3), 271-276.

Full Text: [2003\Desalination158, 271.pdf](2003/Desalination158,%20271.pdf)

Abstract: The coupling of the adsorption of humic acids (HA) at 10 mg/l onto Algerian montmorillonite pillared by polyaluminium chloride (Mont-Al-13)to a microfiltration process through a polysulfone membrane leads to total organic carbon (TOC) removal efficiencies close to 60%. A retention of the modified montmorillonite by the membrane barrier of the order of 95% in terms of turbidity suggests better behaviour of the membrane with respect to blocking, which leads to a decrease of the transmembrane pressure. An increase of the pH towards neutrality is observed during the microfiltration process of both HA and the MontAl(13)-HA couple. This increase is found to be independent of the montmorillonite concentration and permeation flux. It seems reasonable to explain this increase by the interactions between the HA and the modified montmorillonite.

Keywords: Acids, Adsorption, Barrier, Carbon, Chloride, Clay, Concentration, Coupling, Flux, Humic, Humic Acid, Humic Acids, Interactions, Membrane, Microfiltration, Montmorillonite, Organic, Organic Carbon, pH, Pillared Clay, Polysulfone, Pressure, Retention, TOC, Total Organic Carbon, Turbidity, Water

Boncukcuoğlu, R., Yılmaz, A.E., Kocakerimb, M.M. and Çopurb, M. (2004), An empirical model for kinetics of boron removal from boroncontaining wastewaters by ion exchange in a batch reactor. *Desalination*, **160** (2), 159-166.

Full Text: [D\Desalination160, 159.pdf](D/Desalination160,%20159.pdf)

Abstract: In this study, it was investigated boron removal from boron containing wastewaters prepared synthetically. The experiments in which Amberlite IRA 743, boron specific resin was used was carried out in a batch reactor. The ratio of resin/boron solution, boron concentration, stirring speed and temperature were selected as experimental parameters. The obtained experimental results showed that percent of boron removal increased with increasing ratio of resin/boron solution and with decreasing boron concentration in the solution. Stirring speed and temperature had not significant effects on the percent of total boron removal, but they increased the starting boron removal rate. As a result, it was seen that about 99 % of boron in the wastewater could be removed at optimum conditions. On the other hand, the process kinetics were predicted by using heterogeneous fluid-solid reaction models. It was seen statistically that the kinetics of this process agreed the pseudo- second order model, as follows: *XBl*(1−*XB*) = 11,241.5[OH][C]−1.76[*S*/*L*]2.17exp(−19,57*l*.2/*RT*)*t*1.24

Keywords: Boron Removal, Ion Exchange, Amberlite IRA-743, Wastewater, Empirical Kinetics Model

Basci, N., Kocadagistan, E. and Kocadagistan, B. (2004), Biosorption of copper(II) from aqueous solutions by wheat shell. *Desalination*, **164** (2), 135-140.

Full Text: [D\Desalination164, 135.pdf](D/Desalination164,%20135.pdf)

Abstract: The adsorption capacity of wheat shell for copper(II) was studied at various pH (2–7), agitation speeds (50–250 rpm) and initial metal ion concentrations (Co, from 10 to 250 mg.L−1). Maximum biosorption of copper onto wheat shell occurred at 240 rpm agitation speed and at pH between 5 and 6. The biosorption values of copper(II) were increased with increasing pH from 2 to 5 and decreased with increasing copper/wheat shell (x/m) ratios from 0.83 to 10.84 mgCu(II).g−1 wheat shell. The biosorption efficiencies at these x/m ratios were 99% and 52%, respectively, at the end of the 120 min contact time (t). The equilibrium isotherms and kinetics were obtained from batch adsorption experiments at 298 K. It was observed that wheat shell was a suitable biosorbent for removing Cu(II) from aqueous solutions.

Keywords: Biosorption, Copper(II), Wheat Shell, Heavy Metal

? Hamdi, B., Houari, A., Hamoudi, S.A. and Kessaissia, Z. (2004), Adsorption of some volatile organic compounds on geomaterials. *Desalination*, **166** (1-3), 449-455.

Full Text: [2004\Desalination166, 449.pdf](2004/Desalination166,%20449.pdf)

Abstract: Leaching of industrial waste storage settings can lead to severe water resource pollution. Geamaterial barriers made from cement, bentonite and active carbon can overcome such problems. The first part of this work considers the preparation the new geomaterials intended to the dangerous waste storage. These geomaterials have been prepared from Algerian origin clay bentonite materials, the cement, the active carbon and a polymer. Retention properties of such barriers towards some volatile organic compounds (phenol, chlorobenzene, O-xylene) have been assessed through the determination of adsorption isotherms using bath method. The study of different experimental equilibrium isotherms showed clearly the high efficiency of these new adsorbents toward VOCs. On the other hand, it has been shown that the retention of the volatile organic compounds is mainly due active carbon, or for a part, to the clay product of the geomaterial.

Keywords: Geomaterial, Waste, Wastewater, Treatment, COV, Bentonite

? Hadjar, H., Hamdi, B. and Kessaissia, Z. (2004), Adsorption of heavy metal ions on composite materials prepared by modification of natural silica. *Desalination*, **167** (1-3), 165-174.

Full Text: [2004\Desalination167, 165.pdf](2004/Desalination167,%20165.pdf)

Abstract: Recently because of increasing of environmental consciousness and demands, several discussions about the preservation of natural resources have led to more efforts concerning materials of good selectivity and high sorption capacity [1]. We have developed new composite materials with improved adsorptive properties thanks to the presence of Algerian silica (Kieselguhr) [2], after undergoing suitable treatments. We have investigated the effect of different amounts of silica on the performance and adsorptive behaviour of the resulting composites. Thus, the work herein describes our investigations on the adsorption of heavy metal ions onto the composite materials from aqueous solutions in relation to different variables, such as shaking time, concentration of metal ions and pH. The adsorption behaviour of the concerned material is explained on the basis of its chemical nature and porous texture.

Keywords: Activated-Charcoal, Adsorption, Aqueous-Solutions, Capacity, Carbon, Charcoal, Chemical, Composite, Composite Materials, Concentration, Environmental, Heavy Metal, Heavy Metal Ions, Kieselguhr, Lead Nitrates, Materials, Modification, Natural, Natural Resources, Performance, pH, Porous, Preconcentration, Preservation, Properties, Selectivity, Silica, Sorption, Sorption Capacity

? Armagan, B., Turan, M. and Celik, M.S. (2004), Equilibrium studies on the adsorption of reactive azo dyes into zeolite. *Desalination*, **170** (1), 33-39.

Full Text: [2004\Desalination170, 33.pdf](2004/Desalination170,%2033.pdf)

Abstract: Zeolite was used as a low-cost adsorbent to evaluate its ability to remove color from textile effluents. The zeolite (clinoptilolite) used in this study is a natural clay mineral from the Gordes region of Turkey. The adsorption of reactive dyes into zeolite was investigated by a series of batch adsorption experiments. Three reactive dyes (Everzol Black, Everzol Red, Everzol Yellow) were used in laboratory studies. Adsorption test were carried out as a function of solids concentration, conditioning time and dye concentration. The degree of hydrophilicity was found to play an important role in the uptake of reactive dyes. The adsorption results indicated that natural zeolite has a limited adsorption capacity for reactive dyes but can be distinctly improved by modifying its surfaces with quaternary amines. A comparison of natural and modified zeolites at 5% solids concentration indicated that, while the adsorption densities of dyes with natural zeolite yielded negative or slightly positive values, those with modified zeolite gave adsorption densities in the range of 2.9 to 7.6 mg/g.

Keywords: Activated Carbon, Adsorbent, Adsorption, Ammonia Removal, Aqueous-Solutions, Clinoptilolite, Color Removal, Color Removal, Column Operations, Drinking-Water, Dye, Dyes, Fly-Ash, Low-Cost Adsorbent, Mass-Transfer, Modification, Reactive Dyes, Sorption Dynamics, Textile Effluent, Textile Effluents, Waste-Water, Zeolite

? Chakraborty, S., De, S., Basu, J.K. and Das Gupta, S. (2005), Treatment of a textile effluent: Application of a combination method involving adsorption and nanofiltration. *Desalination*, **174** (1), 73-85.

Full Text: [2005\Desalination174, 73.pdf](2005/Desalination174,%2073.pdf)

Abstract: A combination of adsorption and nanofiltration (NF) was adopted for the treatment of a textile dyehouse effluent containing a mixture of two reactive dyes. The effluent stream was first treated in a batch adsorption process with sawdust as an adsorbent to reduce the dye concentration of the effluent by about 83% for Dye 1 and 93% for Dye 2. The effluent from the adsorption unit was passed through an NF unit for the removal of the remaining small amount of dyes and to recover the associated chemicals (mainly salt) in the effluent stream. The dyes remaining after this step were less than 1 ppm. The percentage removal of COD was greater than 99%, and the salt recovery was on the order of 90%. Equilibrium studies were carried out with synthetic solutions of the dyes (both single component as well as two-component systems) at room temperature. The adsorption rates were studied in detail using varying amounts of the adsorbent. NF of the effluent was performed in a cross-flow system using a 400 molecular weight cut-off membrane. A detailed study was carried out to observe the effect of the process parameters, namely applied pressure and bulk velocity on the process outputs such as dye rejection, COD removal, permeate flux and salt recovery. Finally, direct NF of the effluent (with the original high concentration) was undertaken, and the performance of the process was compared with the combination method. The permeate flux for the proposed combined method was found to be about twice that for the direct NF method. The dye rejection improved significantly compared to adsorption.

Keywords: Textile Effluent, Adsorption, Nanofiltration, Reactive Dye, Cod Removal, Permeate Flux, Aqueous-Solution, Waste-Water, Equilibrium, Dyes

? Chuah, T.G., Jumasiah, A., Azni, I., Katayon, S. and Choong, S.Y.T. (2005), Rice husk as a potentially low-cost biosorbent for heavy metal and dye removal: An overview. *Desalination*, **175** (3), 305-316.

Full Text: [2005\Desalination175, 305.pdf](2005/Desalination175,%20305.pdf)

Abstract: Rice husk as a low-value agricultural by-product can be made into sorbent materials which are used in heavy metal and dye removal. It has been investigated as a replacement for currently expensive methods of heavy metal removal from solutions. Currently, the study of rice husk as a low-cost sorbent for removing heavy metals has regained attention. The heavy metals being studied are: As(V) [1], Au [2,3], Cr(IV) [4], Cu and Pb [5,6], Fe, Mn, Zn, Cu [7] and Cd(II) [8-10]. Rice husk is also being used to treat textile dyes such as like malachite green [11,12] and acid yellow 36 [13]. The treatment and preparation of rice husk activated carbon are of importance and became a subject of study [14-16]. In this review an extensive list of previous and current literature on rice husk activated carbons in removing heavy metals and dyes, their preparation or treatment and isotherms studies were complied to provide a summary of available information on rice husk and its potential as a low-cost sorbent.

Keywords: Rice Husk, Heavy Metals, Adsorption, Dye, Isotherms, Sorbents, Milling By-Products, Waste-Water, Aqueous-Solutions, Activated Carbons, Malachite Green, Color Removal, Textile Effluents, Porous Carbon, Wheat-Straw, Acid Dyes

? Zermane, F., Naceur, M.W., Cheknane, B. and Messaoudene, N.A. (2005), Adsorption of humic acids by a modified Algerian montmorillonite in synthesized seawater. *Desalination*, **179** (1-3), 375-380.

Full Text: [2005\Desalination179, 375.pdf](2005/Desalination179,%20375.pdf)

Abstract: Pretreatment of seawater by adsorption onto low-cost and readily available materials is very important for guaranteeing the viability of desalination by reverse osmosis. For this purpose, the adsorption capacity of a modified Algerian montmorillonite was studied. A comparison with a similarly modified commercial Montmorillonite K-10 (Fluka) was also made. Modification of the montmorillonitic matrices was achieved by inorgano-organic pillaring. Adsorption performances were tested for synthesized seawater (TDS =37 g/l) doped with humic acid at 5 mg/l. Kinetic study results revealed better stability of the Algerian montmorillonite with respect to organic matter and salts. On the other hand, pH variation greatly influenced the interactions between the adsorbent material and the HA macromolecule. At pH 3, the kinetic study revealed a 60% elimination of humic matter as early as the first 30 min. Afterwards, it reached a maximum value of 70% for an equilibrium time of 3 h. An unexpected effect was the simultaneous substantial conductivity decrease reaching 35% in the presence of the combined pillared montmorillonite (Mont-Al-CTAB) at pH 3. It seems that the presence of a cationic tensioactive constituted of amphiphilic molecules is a source of interaction between cations and organic molecules. Moreover, at pH 3, which is below 3.5 corresponding to the value of the point zero charge of Mont-Al-CTAB, cationic exchanges did exist.

Keywords: Acids, Adsorption, Capacity, Conductivity, Desalination, Elimination, Equilibrium, Humic, Humic Acid, Humic Acids, Interaction, Interactions, Kinetic, Kinetic Study, Made, Materials, Matter, Montmorillonite, Organic, Organic Matter, Organic Molecules, pH, Pillaring, Reverse Osmosis, Seawater, Source, Stability, Viability, Zero Charge

? Jouad, E.M., Jourjon, F., Le Guillanton, G. and Elothmani, D. (2005), Removal of metal ions in aqueous solutions by organic polymers: Use of a polydiphenylamine resin. *Desalination*, **180** (1-3), 271-276.

Full Text: [2005\Desalination180, 271.pdf](2005/Desalination180,%20271.pdf)

Abstract: Adsorption of Ni(II), Cu(II), Zn(II), Pb(II) and Cd(II) ions on a polydiphenylamine resin prepared at a strongly oxidizing controlled potential of 3.2 V (vs. ECS) was studied in aqueous solutions. The optimum sorption conditions were determined. The optimum pH for the removal of metal ions was between 4 and 6 for Ni(II), 6 for Cu(II) and Pb(II) and 5 for Zn(II) and U(II). The total sorption capacity of the resin was 57.3 mg g-1 for Ni(II), 23 mg g-1 for Cu(II), 36.9 mg g-1 for Zn(II), 19 mg g-1 for Pb(II) and 24.5 mg g-1 for Cd(II). The sorption capacity was compared with other conventional chelating polymers. The sorption kinetics was fairly rapid, as apparent from the loading half time (t(1/2)) values, indicating a better accessibility of the chelating sites. The study of the selectivity of the metal ions in the binary solutions shows that the resin presents a higher affinity for the ions of nickel(II).

Keywords: Polydiphenylamine Resin, Sorption Capacity, Sorption Kinetics, Selective Property, Removal, Metallic Trace Elements, Heavy-Metals, Waste-Water, Copper, Lead, Polymerization, Diphenylamine, Biosorption, Chitosan, Streams

? Yeddou, N. and Bensmaili, A. (2005), Kinetic models for the sorption of dye from aqueous solution by clay-wood sawdust mixture. *Desalination*, **185** (1-3), 499-508.

Full Text: [2005\Desalination185, 499.pdf](2005/Desalination185,%20499.pdf)

Abstract: The sorption of basic red dye 46 onto the mixture of clay and wood-sawdust has been studied in a batch system. The influence of initial dye concentration, pH and temperature have been reported. A comparison of kinetic models applied to the adsorption of basic red (BR46) on the mixture was evaluated for the pseudo-second order and Elovich kinetic models. Results show that the pseudo-second order kinetic model was found to agree well with the experimental data.

In addition, an activation energy of sorption has also been determined based on the pseudo-second order rate constants.

The Langmuir and Freundlich isotherms were used to fit the experimental data.

Keywords: Kinetics, Pseudo-Second Order, Dye, Sorption, Color Removal, Acid Dye, Adsorption, Adsorbent, Copper, Solids, Ions

? Chabani, M. and Bensmaili, A. (2005), Kinetic modelling of the retention of nitrates by Amberlite IRA 410. *Desalination*, **185** (1-3), 509-515.

Full Text: [2005\Desalination185, 509.pdf](2005/Desalination185,%20509.pdf)

Abstract: The rate of retention of nitrates on a synthetic resin, Amberlite IRA 410, was measured at 22°C. Three simplified kinetic models, pseudo-first-order, pseudo-second-order and intraparticle diffusion were tested in order to determine the mechanisms during the nitrates uptake. The influence of parameters such as the stirring velocity, the size of the particles, the mass of the resin and the concentration of the solution was examined. The results were shown that the fixing of nitrates could be best described by the pseudo second order and the intraparticle diffusion models. The coefficients of correlation obtained during the adjustment of the experimental values to the two models are higher than 98% what gives access to the kinetic parameters of the two models. The dependence of kinetics parameters on initial concentration and mass adsorbent is represented by the simple empirical equations. The normalized standard deviations between the simulated and measured results were calculated and discussed.

Keywords: Resin, Solid-Liquid Adsorption, Model Kinetics, Nitrates

? Jumasiah, A., Chuah, T.G., Gimbon, J., Choong, T.S.Y. and Azni, I. (2005), Adsorption of basic dye onto palm kernel shell activated carbon: Sorption equilibrium and kinetics studies. *Desalination*, **186** (1-3), 57-64.

Full Text: [2005\Desalination186, 57.pdf](2005/Desalination186,%2057.pdf)

Abstract: Adsorbents prepared from palm kernel shell, an agricultural waste product, were used to remove a dye, Basic Blue 9, from an aqueous solution in batch mode at a constant temperature of 28 °C. The sorption kinetics and equilibrium of basic dye onto palm kernel shell activated carbon (PKSAC) were studied. The isotherm data were well described by the Redlich–Peterson isotherm model, with constants obtained from non-linear regression. The sorption kinetics are well described by the pseudo-second-order kinetic model. These studies suggested that PKSAC could be used as low-cost alternatives in wastewater treatment for dye removal.

Keywords: Palm Kernel Shell, Activated Carbon, Basic Blue 9, Isotherm, Kinetics, Adsorption

? Touaibia, D. and Benayada, B. (2005), Removal of mercury(II) from aqueous solution by adsorption on keratin powder prepared from Algerian sheep hooves. *Desalination*, **186** (1-3), 75-80.

Full Text: [2005\Desalination186, 75.pdf](2005/Desalination186,%2075.pdf)

Abstract: The batch removal of mercury(II) from aqueous solution using keratin powder (size <63 µm) prepared from steamed Algerian sheep hooves was investigated. The influence of sorption time, initial pH, and initial concentration of Hg(II) was evaluated. It is shown that steamed hoof powder from Algerian sheep hooves has a relatively high adsorption capacity for Hg(II). pH values between 2 and 10 have no effect on the sorption of Hg(II). The adsorption equilibrium was established in 3 h. The equilibrium data were described well by the Freundlich model. A comparison of kinetic models applied to the adsorption of Hg(II) on the Algerian sheep hoof powder was evaluated for the pseudo-first-order and pseudo-second-order models. Results show that the pseudo-second-order model was found to correlate well the experimental data.

Keywords: Adsorption, Hg(II), Adsorption Kinetics, Keratin Powder, Steamed Hoof Powder, Aqueous Solution

? Kobya, M., Hiz, H., Senturk, E., Aydiner, C. and Demirbas, E. (2006), Treatment of potato chips manufacturing wastewater by electrocoagulation. *Desalination*, **190** (1-3), 201-211.

Full Text: [2006\Desalination190, 201.pdf](2006/Desalination190,%20201.pdf)

Abstract: Treatment of wastewater from potato chips manufacturing by electrocoagulation (EC) was investigated. Experiments were conducted to determine the optimum operating conditions such as electrode type, pH, current density and retention time. Aluminium and iron electrodes were used, and aluminium electrodes were found to be more suitable since it had a higher removal rate of COD, turbidity and suspended solids than the iron electrode. The removal efficiencies of COD and turbidity were high, being 60% and 98%, respectively, with retention time < 40 min. 0.05-1.75 kg (per kg COD removed) of dried sludge was removed. COD removal kinetics during EC process was described by a macro-kinetics model. Results from the kinetic studies showed that the kinetic data fit the second-order kinetic model well. The operating costs investigated in the present study were the energy cost of EC and the material cost due to the consumption of aluminium electrode. Operating costs were varied in the range of 0.48 to 5.42 $/m3 and 0.62 to 6.32 $/m3 wastewater treated at 20-300 A/m2 and 5-40 min, respectively. The energy consumption was 4 kWh/m3 for wastewater treated less than 8 min under typical operating conditions.

Keywords: Electrocoagulation, Potato Chips Wastewater, Removal Efficiency, Electrode Materials, Operating Cost, Cost-Effective Pretreatment, Aluminum Electrodes, Electrochemical Method, Anaerobic Treatment, Natural Systems, Operating Cost, Wastewaters, Removal, Plant, Decolorization

? Eren, Z. and Acar, F.N. (2006), Adsorption of Reactive Black 5 from an aqueous solution: equilibrium and kinetic studies. *Desalination*, **194** (1-3), 1-10.

Full Text: [2006\Desalination194, 1.pdf](2006/Desalination194,%201.pdf)

Abstract: Removal of a reactive dye, Reactive Black 5, from an aqueous solution was studied by adsorption on powdered activated carbon (PAC) and Afsin-Elbistan fly ash (Turkey). The adsorption of the dye on PAC and fly ash was investigated during a series of batch adsorption experiments carried out to determine the effect of initial dye concentration and contact time. The amounts adsorbed at equilibrium were measured. The Langmuir and Freundlich isotherm models were tested for their applicability. The equilibrium data satisfied both Langmuir and Freundlich models. The adsorption capacity of PAC and fly ash were found to be 58.823 mg and 7.936 mg dye per gram of adsorbent, respectively. The experimental data were analysed using the pseudo-first-order and pseudo-second-order adsorption kinetic models. According to these models, the rate constants were evaluated for initial dye concentrations. The experimental data fit the second-order kinetic model.

Keywords: Adsorption, Adsorption Isotherms, Kinetics of Adsorption, Activated Carbon, Fly Ash, Reactive Dye, Fly-Ash, Waste-Water, Industry Waste, Congo Red, Azo-Dye, Removal, Biosorption, Coal, Adsorbents, Effluents

? Teng, M.Y. and Lin, S.H. (2006), Removal of basic dye from water onto pristine and HCl-activated montmorillonite in fixed beds. *Desalination*, **194** (1-3), 156-165.

Full Text: [2006\Desalination194, 156.pdf](2006/Desalination194,%20156.pdf)

Abstract: The removal of a basic dye from water onto pristine montmorillonite and HCl-activated montmorillonites in fixed beds was investigated. Experiments were carried out as a function of liquid flow rate, influent dye concentration, and column length. The adsorption capacity of basic dye onto pristine clay could be largely improved when the clay is activated by HCl. The mathematical models that involve two parameters of standard deviation (sigma) and the time (t(0)) were tested to fit the measured breakthrough curves of basic dye in fixed beds. A macroscopic model developed by Hutchins and kinetic studies were fitted to calculate the adsorption capacity in fixed beds. It is indicated that the predominating step of mass transfer for the adsorption system was diffusion of stagnating liquid-film for pristine clay, but intraparticle diffusion for HCl-activated clay. In addition, the application of the mathematical models is discussed.

Keywords: Montmorillonite, Acid Activation, Dye, Removal, Breakthrough Curve, Organic Contaminants, Methylene-Blue, Mas NMR, Adsorption, Acid, Bentonite, Carbon, Clay, Equilibrium, Kinetics

? Issabayeva, G., Aroua, M.K. and Sulaiman, N.M. (2006), Electrodeposition of copper and lead on palm shell activated carbon in a flow-through electrolytic cell. *Desalination*, **194** (1-3), 192-201.

Full Text: [2006\Desalination194, 192.pdf](2006/Desalination194,%20192.pdf)

Abstract: Palm shell is an abundant solid waste generated from the palm oil industry in Malaysia. Activated carbon obtained from palm shells has good electrochemical properties and may be used as a working electrode material to remove ions of heavy metals from industrial wastewaters. Results are presented on the electrodeposition of copper and lead ions onto palm shell activated carbon electrodes in terms of current efficiency (%). The study was carried out in a continuous packed-bed electrochemical cell. The effects of applied current, solution flow rate, pH of the feed, and presence of complexing agents namely malonic and boric acids on the overall current efficiency were investigated. The results showed that the current efficiency increases with an increase of the flow rate. The application of more negative current to the electrolytic cell resulted in the decrease of current efficiency values. Presence of malonic acid resulted in a relative increase of the current efficiency compared to the single metal system for both pH 3 and 5. The presence of boric acid also resulted in a similar overall increase of the current efficiency. The concentration of the solution leaving the cell strongly depended on the current values applied as well as the solution flow rate; for copper it varied between 0-20 mg/L, and for lead it was between 0-5 mg/L from an inlet value of 50 mg/L for both ions.

Keywords: Acid, Activated Carbon, Adsorption, Boric Acid, Carbon, Cathode, Columns, Copper, Current Efficiency, Electrochemical Reactor, Electrodeposition, Heavy Metals, Heavy-Metals, Industrial, Industrial Wastewaters, Ion, Lead, Malaysia, Malonic Acid, Metals, Palm Shell, pH, Removal, System, Waste-Water

? Bulut, Y. and Aydin, H. (2006), A kinetics and thermodynamics study of Methylene blue adsorption on wheat shells. *Desalination*, **194** (1-3), 259-267.

Full Text: [2006\Desalination194, 259.pdf](2006/Desalination194,%20259.pdf)

Abstract: The use of wheat shells (WMS) for the removal of methylene blue from aqueous solutions at different contact times, temperatures, pH, adsorbent doses and initial dye concentration was investigated. The adsorption process attains equilibrium within 60 min. The extent of dye removal decreased with increasing adsorbent dosage and also increased with increasing contact time, temperature, and in solution concentration. The adsorption isotherms are described by means of the Langmuir and Freundlich isotherms. It was found that the Langmuir equation fit better than the Freundlich equation. Maximum adsorption capacity (Q(m)) was calculated at different temperatures (303, 313, and 323 K) 16.56, 20.83, and 21.50 mg/g, respectively. The adsorption kinetics of methylene blue could be described by the pseudo-second-order reaction model. The activation energy of system (E-a) was calculated as 16.62 kJ/mol. Free energy of adsorption (Delta G(0)), enthalpy (Delta H-0), and entropy (Delta S-0) changes were calculated to predict the nature of adsorption. The estimated values for Delta G(0) were -22.64, -24.11, and -26.35 kJ/mol at 303, 313, and 323 K, respectively, which are rather low, indicating that a spontaneous process occurred. The enthalpy changes and entropy of adsorption were 33.41 kJ/mol and 185 J/mol K, respectively. The obtained results are: (1) high levels of color removal (> 95%) were achieved with low contact times adsorbent/dye (less than 90-min contact); and (2) the whole WHS can be successfully used as adsorbent of methylene blue in aqueous solutions. WHS, an inexpensive and easily available material, can be an alternative for more costly adsorbents used for dye removal in wastewater treatment processes.

Keywords: Adsorption, Isotherm, Methylene Blue, Wheat Shells, Dye Adsorption, Kinetics of Adsorption, Thermodynamics, Aqueous-Solutions, Waste-Water, Dye Removal, Basic-Dyes, Sawdust, Carbon, Equilibrium, Mechanism, Powder, Acid

? Aydin, H. and Baysal, G. (2006), Adsorption of acid dyes in aqueous solutions by shells of bittim (*Pistacia khinjuk* Stocks). *Desalination*, **196** (1-3), 248-259.

Full Text: [2006\Desalination196, 248.pdf](2006/Desalination196,%20248.pdf)

Abstract: The effectiveness of adsorption for dye removal from wastewaters has made it an ideal alternative to other expensive treatment options. The removal of acid red 183 (AR) and acid green 25 (AG) onto shells of bittim (*Pistacia khinjuk* Stocks) (BTS) from aqueous solutions was investigated using parameters such as contact time, pH, temperature, adsorbent doses, and initial dye concentration. Adsorption isotherms of dyes onto BTS were determined and correlated with common isotherm equations such as the Langmuir and Freundlich models. Adsorption equilibrium was reached within 30 min. It was found that the Langmuir isotherm appears to fit the isotherm data better than the Freundlich isotherm. Parameters of the Langmuir and Freundlich isotherms were determined using adsorption data. The maximum adsorption capacities for AR and AG onto BTS at 308, 313, and 318 K were found to be 33, 28, and 20; 16, 18, and 7 mg/g, respectively. The adsorption kinetics of AR and AG could be described by the pseudo-second-order reaction model. The data obtained from adsorption isotherms at different temperatures were used to calculate several thermo-dynamic quantities such as the Gibbs energy (Delta G(0)), enthalpy (Delta H-0), and entropy (Delta S-0) of adsorption. The adsorption process was found to be spontaneous, endothermic and physical in nature. Locally available adsorbent BTS was found to have a low cost and was promising for the removal of AR and AG from aqueous solutions.

Keywords: Acid Dyes, Adsorption, Adsorption Isotherms, Adsorption Modeling, Basic-Dyes, Cost, Effectiveness, Equilibrium, Freundlich Isotherm, Isotherms, Kinetics, Langmuir Isotherm, Low-Cost Materials, Mechanism, Methylene-Blue, Model, Models, Powder, Process, Pseudo Second Order, Pseudo-Second-Order, Removal, Sawdust, Sorption, Temperature, Treatment, Waste-Water

? Hubicki, Z. and Wojcik, G. (2006), Studies of removal of platinum(IV) ion microquantities from the model chloride solutions on the ion exchangers of the functional quaternary ammonium groups. *Desalination*, **197** (1-3), 82-93.

Full Text: [2006\Desalination197, 82.pdf](2006/Desalination197,%2082.pdf)

Abstract: Platinum and other platinum metals have been widely applied in industry. The recovery of noble metals from industrial wastes becomes an economic issue. The laboratory studies of removal of platinum(IV) microquantities from 0.1-6M hydrochloric acid solutions on the ion-exchangers of the functional quaternary ammonium groups (Amberlyst A 26, Purolite A 850 and Lewatit MP 500 A) were done. For these ion-exchangers the recovery factor values [%R Pt(IV)] as well as the sorption isotherms depending on the kind of aqueous phase and phase contact time were determined. Moreover, the weight and bed distribution coefficients as well as working and total ionexchange capacities were calculated from the platinum(IV) breakthrough curves. Due to their high ion-exchange capacity in relation to platinum(IV) and great resistance to chemical agents, these ion-exchangers can be applied in technologies of platinum recovery and analysis of its trace amounts.

Keywords: Ion-Exchange, Platinum, Removal, Base Metals, Separation, Palladium, Sorption, Resin, Extraction, Recovery, Pd(II)

? Chabani, M., Amrane, A. and Bensmaili, A. (2006), Kinetic modelling of liquid-phase adsorption of nitrates on ionized adsorbent. *Desalination*, **197** (1-3), 117-123.

Full Text: [2006\Desalination197, 117.pdf](2006/Desalination197,%20117.pdf)

Abstract: The risks associated with the contamination of drinking water by nitrates are methemoglobinemy in infants, the potential risks of cancerogenicity and teratogenicity. Membrane processes and resins are very efficient in the elimination of nitrates. The resin used in this work was an ionised adsorbent Amberlite IRA 400. The objective of the work was to improve the knowledge concerning the adsorption mechanism and to determine the kinetic parameters. The study was undertaken in a batch reactor at controlled pH and temperature. The effect of some parameters, like the size of particles, the stirring velocity, the nitrate concentration and the mass of adsorbent used, were examined. The chemical reaction was found to control the global process; two kinetic models, a pseudo first and a second-order reaction were then compared to describe the process. It was found that the adsorption follows the second-order kinetic.

Keywords: Kinetic Modelling, Liquid-Phase Adsorption, Resin, Nitrates, Effluents, Sorption, Ions

? Kabay, N., Yilmaz, İ., Brjyak, M. and Yüksel, M. (2006), Removal of boron from aqueous solutions by a hybrid ion exchange-membrane process. *Desalination*, **198** (1-3), 158-165.

Full Text: [2006\Desalination198, 158.pdf](2006/Desalination198,%20158.pdf)

Abstract: For irrigation water boron is required for certain metabolic activities in plants. However, higher boron levels accelerate plant decay and expiration. Different plants can withstand different boron levels. For example, the optimal boron concentration range is 0.3-0.5 mg/L for citrus and grapes but is 0.5-0.75 mg/L for corn. Thus, the B-reduction in irrigation waters seems to be the most important challenge for environmental engineers as well as food producers. The WHO recommends a maximum concentration limit of boron of 0.5 mg B/L for drinking water. The general objective of this study was to explore the suitability and performance of the hybrid ion exchange-microfiltration process for boron removal from aqueous solutions. The efficiency of this novel separation technology for boron removal was investigated and compared to conventionally used ion-exchange processes. For experimental tests, commercially available chelating ion-exchange resins containing N-methyl glucamine groups were used. The effect of particle size of chelating resins on their kinetic performance for boron removal was compared using both processes.

Keywords: Boron, Ion Exchange, Chelating Resins, Boron Removal, Water Treatment, Hybrid Process, Microfiltration, Wastewater, Integrated Systems, Geothermal Waste-Water, Sorption-Elution, Power-Plant, Resins, Adsorption, Recovery, Tests, Model

? Yilmaz, İ., Kabay, N., Brjyak, M., Yüksel, M., Wolska, J. and Koltuniewicz, A. (2006), A submerged membrane-ion-exchange hybrid process for boron removal. *Desalination*, **198** (1-3), 310-315.

Full Text: [2006\Desalination198, 310.pdf](2006/Desalination198,%20310.pdf)

Abstract: The studies focused on evaluation of a sorption membrane hybrid process using N-methyl glucamine chelating resins for boron sorption and submerged microfiltration membrane for removal of resin-boron complexes. Hollow fiber polypropylene membranes with 0.4 μm pores were used as filtration material. Boron sorption kinetics were determined for two kinds of resins: ground Diaion CRB02 (Mitsubishi) and Dowex XUS 43594.00 (Dow Chemical). The first resin sorbed boron much faster that the latter: the Diaion resin needed 5 min while the Dowex. resin took 30 min to decrease the boron concentration to half the initial concentration. For the tests carried out in the sorption-membrane system, it was shown that the process reached its steady-state condition after 1 h.

Keywords: Boron, Ion Exchange, Microfiltration, Submerged Membrane, Hybrid Process, Geothermal Waste-Water, Sorption-Elution, Power-Plant, Resins, Recovery, Tests

? Teng, M.Y. and Lin, S.H. (2006), Removal of methyl orange dye from water onto raw and acid-activated montmorillonite in fixed beds. *Desalination*, **201** (1-3), 71-81.

Full Text: [2006\Desalination201, 71.pdf](2006/Desalination201,%2071.pdf)

Abstract: The removal of an acid dye from water onto raw montmorillonite and HCl-activated montmorillonites in fixed beds was investigated. Experiments were carried out as a function of liquid flow rate, feed dye concentration, and bed height. The adsorption capacity of acid dye onto raw clay could be largely improved when the clay was activated by HCl. The increase of adsorption capacity was due to the Al3+ or Fe2+ ions of montmorillonite replaced by W ion after HCl acidification, which was indicated by surface area (BET) and X-ray diffraction analysis. The mass transfer models which involve two parameters of maximum adsorption capacity (NO) and kinetic constant (k(AB)) from Adams-Borhart model and two parameters of kinetic coefficient of the external mass transfer (P.) and maximum adsorption capacity (N-0) from Wolboraska model were proposed. Those models could satisfactorily describe the measured breakthrough curves of acid dye in fixed beds (standard deviation < 5%). The effect of the type of clay (raw, HCl-activated) on the values of N-0, k(AB), and beta(a) was discussed, and the application potential of acid-activated clay for adsorption removal of acid dye from water was also demonstrated.

Keywords: Montmorillonite, Acidification, Dye, Removal, Fixed Bed, Breakthrough Curve, Organic Contaminants, Na+-Montmorillonite, Catalytic Activity, Aqueous-Solution, Adsorption, Bentonite, Carbon, Clay, Kinetics, Blue

? Tor, A. (2006), Removal of fluoride from an aqueous solution by using montmorillonite. *Desalination*, **201** (1-3), 267-276.

Full Text: [2006\Desalination201, 267.pdf](2006/Desalination201,%20267.pdf)

Abstract: The removal of fluoride from aqueous solution by using montmorillonite was studied by a batch equilibration technique. Influence of contact time, pH, initial fluoride concentration and adsorbent dosage on the adsorption were investigated. It was found that the sufficient time for adsorption equilibrium of fluoride ions is 180 min. The maximum removal of fluoride ion was obtained at pH 6. The mechanism for fluoride removal was explained by considering the interaction between the metal oxides at the surface of montmorillonite and fluoride ions. The adsorption isotherms were analyzed using the Langmuir, the Freundlich, and the three-parameter Redlich–Peterson isotherms. In order to determine the best-fit isotherm, two error analysis methods, the linear coefficient of determination and the Chi-square statistic test for determination of a non-linear model, were used to evaluate the data. According to the error analysis, both Freundlich and Redlich-Peterson isotherm models were found to represent the measured sorption data well. The adsorbed fluoride could be easily desorbed by washing the adsorbent with a solution pH of 12.

Keywords: Montmorillonite, Removal of Fluoride, Adsorption, Chi-Square Test

? Jusoh, A., Shiung, L.S., Ali, N. and Noor, M.J.M.M. (2007), A simulation study of the removal efficiency of granular activated carbon on cadmium and lead. *Desalination*, **206** (1-3), 9-16.

Full Text: [2007\Desalination206, 9.pdf](2007/Desalination206,%209.pdf)

Abstract: The excessive release of heavy metals into the environment is a major concern worldwide. Adsorption process is among the most effective techniques for heavy metals removal from waste streams and activated carbon has been widely used as an adsorbent. Therefore, this study was carried out to examine the potential and effectiveness of granular activated carbon (GAC) to remove heavy metals, particularly cadmium (Cd) and lead (Pb) through adsorption from the prepared solutions respectively. A fixed bed column test was conducted to simulate the actual condition of adsorption in a continuous manner in a filtration process. Different flow rates were used to evaluate their effects on the column performance where different breakthrough curves were obtained. The Adam-Bohart breakthrough curve equation was used to predict the breakthrough curve and to obtain the adsorption capacity of cadmium and lead on GAC. The results showed that the Adam-Bohart equation fitted the experimental data well and cadmium and lead can be successfully removed by granular activated carbon (GAC) through the column test.

Keywords: Granular Activated Carbon, Heavy Metals, Cadmium, Lead, Adsorption Isotherms, Aqueous-Solutions, Basic-Dyes, Adsorption, Waste, Beds

? Yeddou, N. and Bensmaili, A. (2007), Equilibrium and kinetic modelling of iron adsorption by eggshells in a batch system: effect of temperature. *Desalination*, **206** (1-3), 127-134.

Full Text: [2007\Desalination206, 127.pdf](2007/Desalination206,%20127.pdf)

Abstract: This paper aims to investigate the sorption of Fe(III) onto eggshells. In our experiments the batch sorption is studied with respect to solute concentration, contact time, adsorbent dose and temperature. The results show that the sorption capacity decreases with an increase in temperature from 20 to 50°C at the initial Fe(III) solution concentration of 5 mgl-1. Pseudo-second order model can be used to describe the kinetics of Fe(III) sorption. The constants obtained from the pseudo-second order kinetic model at different temperatures were evaluated and the activation energy was found to be -13.40 kJ/mol. Thermodynamic parameters such as enthalpy, entropy and Gibb’s free energy changes were also calculated. The Freundlich and Langmuir adsorption models were applied to experimental equilibrium data and the isotherm constants were calculated using linear regression analysis.

Keywords: Activation, Activation Energy, Adsorbent, Adsorbents, Adsorption, Analysis, Aqueous-Solutions, Biomass, Biosorption, Capacity, Concentration, Copper(II), Eggshells, Energy, Entropy, Equilibrium, Ferric, Freundlich, Iron, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Metals, Model, Modelization, Modelling, Models, Paper, Parameters, Pseudo-Second Order, Pseudo-Second-Order, Regression Analysis, Removal, Saccharomyces-Cerevisiae, Sorption, Sorption Capacity, Sorption Kinetics, Temperature, Water

? Bouguerra, W., Ali, M.B., Hamrouni, B. and Dhahbi, M. (2007), Equilibrium and kinetic studies of adsorption of silica onto activated alumina. *Desalination*, **206** (1-3), 141-146.

Full Text: [2007\Desalination206, 141.pdf](2007/Desalination206,%20141.pdf)

Abstract: Among the treatment processes appropriate for the removal of silica, it seems that activated alumina presents more advantages than membrane separation and chemical processes. Silica removal from aqueous solution was investigated using activated alumina. The nature of silica in a solution has a significant influence on its removal. Optimization of pH for adsorption of silica was done by studying the uptake of silica over activated alumina as a function of pH. Studies were conducted to delineate the effect of adsorbent dose and temperature. The adsorption equilibrium data followed both Langmuir and Freundlich isotherms. The effect of foreign ions on adsorption such as sulfate, fluoride, nitrate and hydrogenocarbonate did not significantly decrease the amount of silica removed. Silica concentrations were obtained by absorbance measurement of the of yellow or blue-colored silicomolybdic acid. Anion species concentrations were determined by ionic chromatography.

Keywords: Adsorption, Silica, Equilibrium, Adsorption Kinetics, Activated Alumina,Membranes, Removal, Waters

? Chabani, M., Amrane, A. and Bensmaili, A. (2007), Kinetics of nitrates adsorption on Amberlite IRA 400 resin. *Desalination*, **206** (1-3), 560-567.

Full Text: [2007\Desalination206, 560.pdf](2007/Desalination206,%20560.pdf)

Abstract: Ion-exchange technology was studied to remove nitrates using Amberlite IRA 400. Predicting the rate at which adsorption takes place for a given system is probably the single most important factor for adsorber design, with adsorbate residence time and ultimately the reactor dimensions controlled by the system’s kinetics. A fixed volume stirred tank reactor was used to study the kinetics of adsorption in a single-component system. Process parameters including the rate of agitation, pH and temperature were examined and the obtained data were modelled using five kinetic models including the pseudo-first-order equation, second-order equation, the modified Freundlich, the pore diffusion model and the Elovich equation. The best fit of experimental adsorption data was obtained by means of the pore diffusion and pseudo-second-order models. Equilibrium data were fitted to the Frumkin and Langmuir isotherm equations, and the equilibrium data were found to be well represented by the Langmuir isotherm equation.

Keywords: Activated Carbon, Adsorption, Design, Diffusion, Elovich Equation, Equilibrium, Freundlich, Isotherm, Kinetic, Kinetic Models, Kinetics, Kinetics of Adsorption, Langmuir, Langmuir Isotherm, Model, Models, Modified, Nitrates, Parameters, pH, Pore Diffusion, Pseudo-Second-Order, Reactor, Removal, Residence Time, Resin, Second-Order Equation, Temperature, Waste-Water

? Choksi, P.M. and Joshi, V.Y. (2007), Adsorption kinetic study for the removal of nickel(II) and aluminum(III) from an aqueous solution by natural adsorbents. *Desalination*, **208** (1-3), 216-231.

Full Text: [2007\Desalination208, 216.pdf](2007/Desalination208,%20216.pdf)

Abstract: The batch removal of divalent nickel (Ni2+) and trivalent aluminum (Al3+) from wastewater under different experimental conditions using economic adsorbents was investigated in this study. These natural adsorbents were from different sources i.e. starch, activated charcoal, wood charcoal and clay (type-bleaching earth). The present research paper contains the effect of pH and concentration of biomass on the adsorption kinetics. The batch sorption kinetics was studied for first order reversible reaction, pseudo first and second order reaction. Also the rate constant of adsorption for all these kinetic models has been calculated. Hence this is a physical adsorption, so an attempt was made to recover adsorbed metals from adsorbents. Also an attempt was done to obtain a thermodynamic parameter Delta G(0) for getting more information about the behavior of adsorption process.

Keywords: Acid, Activated Charcoal, Adsorbents, Adsorption, Adsorption Kinetics, Adsorption Process, Aluminum, Aqueous Solution, Batch, Batch Sorption, Behavior, Biomass, Charcoal, Clay, Cobalt(II), Concentration, D2ehpa, Divalent Nickel, Earth, Economic, Effect Of Ph, Extraction, First Order, Information, Ion-Exchange Method, Kinetic, Kinetic Models, Kinetic Study, Kinetics, Made, Metals, Models, Natural, Natural Adsorbents, Ni2+, Nickel, Order, Paper, pH, Physical, Physical Adsorption, Process, Rate Constant, Reaction, Recovery, Removal, Research, Reversible, Second Order, Separation, Sodium-Salts, Sorption, Sorption Kinetics, Sources, Starch, Thermodynamic, Thermodynamic Parameter, Thermodynamic Parameters, Trivalent Aluminum, Wastewater, Waters, Wood

? Aber, S., Daneshvar, N., Soroureddin, S.M., Chabok, A. and sadpour-Zeynali, K. (2007), Study of acid orange 7 removal from aqueous solutions by powdered activated carbon and modeling of experimental results by artificial neural network. *Desalination*, **211** (1-3), 87-95.

Full Text: [2007\Desalination211, 87.pdf](2007/Desalination211,%2087.pdf)

Abstract: In this work, removal of acid orange 7 (AO7) by powdered activated carbon, from aqueous solutions with initial concentrations of 150 ppm to 350 ppm and initial pH values of 2.8, 5.8, 8.0 and 10.5 at 25°C was studied. Experiments were done in batch mode and the experimental solutions were agitated periodically. All concentrations were measured spectrophotometrically at 483 nm and three times replicated. In most cases, after 75 min contact time, the most of AO7 removal is performed. The maximum equilibrium removal of acid orange 7 (AO7) was 96.24% for its initial concentration of 150 ppm at pH(i) = 2.8, and minimum equilibrium removal was 48.05% for initial concentration of 350 ppm at pH(i) = 5.8. At the similar experimental conditions, application of different initial. pH values altered the AO7 removal percent no more than 9.06%. It is found that the adsorption system follows the second-order adsorption rate expression and the constants of the rate expression at different conditions were calculated which are comparable and often higher than other adsorbents in adsorption of other dyes. The constants of Langmuir equation, Q and b, and constants of Freundlich equation, K-f and l/n, were calculated and results show that the adsorption process is favorable. Comparison of R-2 values shows that fitting of Freundlich equation to experimental data is better than Langmuir equation. The experimental results were also modeled by artificial neural network with. mean relative error of 5.81%. This model was developed in Matlab 6.5 environment using a 3-layer feed forward. backpropagation network with 3, 2 and 1 neurons in first, second and third layers, respectively.

Keywords: Acid, Acid Orange 7, Acid Orange-7 Dye, Activated Carbon, Adsorbents, Adsorption, Adsorption, Adsorption Process, Adsorption Rate, Aqueous Solution, Aqueous Solutions, Artificial Neural Network, Backpropagation, Batch, Batch Mode, Carbon, Cellulose, Chitosan, Concentration, Concentrations, Constants, Contact Time, Decolorization, Decolourization, Degradation, Dyes, Environment, Equilibrium, Experimental, Experimental Data, Feed, Fitting, Freundlich, Freundlich Equation, Langmuir, Langmuir Equation, Model, Modeling, Neural Network, pH, pH Values, Powdered Activated Carbon, Process, Rate, Removal, Second Order, Solutions, Spent Brewery Grains, Time, Water

? Kocaoba, S., Orhan, Y. and Akyüz, T. (2007), Kinetics and equilibrium studies of heavy metal ions removal by use of natural zeolite. *Desalination*, **214** (1-3), 1-10.

Full Text: [2007\Desalination214, 1.pdf](2007/Desalination214,%201.pdf)

Abstract: In this study, the removal of heavy metal ions from aqueous solution using; natural clinoptilolite, obtained from the Biga-Canakkale region of Turkey, under different experimental conditions was investigated. The efficiency of zeolite as an adsorbent for the removal of heavy metals such as Cd(II), Cu(II), Ni(II) from aqueous solutions has been determined at the different initial concentration, zeolite amount, agitation speed and pH. Adsorption data have been interpreted in terms of Langmuir and Freundlich equations. The results were provided strong support for the adsorption of heavy metals into clinoptilolite and which were found to fit sufficient by the Langmuir isotherm in the most of case. The selectivity of the studied metals was determined as Cd(II) > Ni(II) > Cu(II). The sorption kinetics was 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 cadmium, copper and nickel metal ions uptake processes followed the pseudo-second order rate expression.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Agitation, Aqueous Solution, Aqueous Solutions, Aqueous-Solutions, Cadmium, Cd, Clinoptilolite, Clinoptilolite, Concentration, Constants, Copper, Copper(II), Correlation, Cu, Diffusion, Efficiency, Equations, Equilibrium, Equilibrium Isotherm, Equilibrium Studies, Exchange, Experimental, Expression, First Order, Freundlich, Heavy Metal, Heavy Metal Ions, Heavy Metals, Heavy-Metal, Intra Particle Diffusion, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherm, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Langmuir-Isotherm, Lead, Mercury(II), Metal, Metal Ions, Metal Ions Removal, Metals, Model, Models, Natural, Natural Clinoptilolite, Natural Zeolite, Ni, Nickel, Order, pH, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Kinetic Model, Pseudo-Second-Order, Rate, Rate Constants, Reaction, Removal, Removal of Heavy Metals, Selectivity, Solutions, Sorption, Sorption Kinetics, Speed, Support, Turkey, Uptake, Zeolite

? Al-Futaisi, A., Jamrah, A. and Ai-Hanai, R. (2007), Aspects of cationic dye molecule adsorption to palygorskite. *Desalination*, **214** (1-3), 327-342.

Full Text: [2007\Desalination214, 327.pdf](2007/Desalination214,%20327.pdf)

Abstract: This paper presents a study on the adsorption of cationic dyes, methylene blue and crystal violet, from aqueous solutions (distilled water and actual groundwater) onto palygorskite clay. In particular, we discuss the effect of dissolved ions, pH, particle size, adsorbent mass, and dye initial concentration on adsorption capacity. It is clearly shown that both dyes adsorption by palygorskite in groundwater is dramatically more effective than in distilled water, i.e., adsorption of cationic dyes by palygorskite is not affect by the postulated competition of the dissolved ions, but in contrary the presence of these ions results in significant improvement of adsorption. Langmuir and Freundlich isotherms failed to represent palygorskite adsorption of basic dyes in groundwater. Therefore, multilayer adsorption isotherms such as BET are proposed. Two simplified kinetic models, pseudo-first order and pseudo-second order, were tested to investigate adsorption mechanisms. It was found that the kinetics of adsorption of the two basic dyes onto the surface of the palygorskite are best described by the pseudo-second order model supporting chemisorption (chemical reaction) as rate controlling mechanism which indicates that the adsorption process is irreversible. Below pH=9, pH has no apparent effect on adsorption; however, for pH greater than 9, the adsorption capacity increases with the pH. Effect of particle size analysis revealed that decreasing the clay particle size has increased the adsorption capacity of the basic dyes.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Mechanisms, Adsorption Process, Affect, Analysis, Aqueous Solutions, Basic Dyes, Basic-Dyes, Behavior, BET, Capacity, Cationic Dye, Cationic Dyes, Chemical, Chemisorption, Clay, Competition, Concentration, Crystal Violet, Dissolved, Dye, Dyes, Dyes Adsorption, Effective, Freundlich, Freundlich Isotherms, Groundwater, Groundwaterl Dissolved Ions, Isotherms, Kinetic, Kinetic Models, Kinetics, Kinetics of Adsorption, Langmuir, Langmuir and Freundlich Isotherms, Mass, Mechanism, Mechanisms, Metal-Ions, Methylene Blue, Methylene-Blue, Model, Models, Montmorillonite, Multilayer, Multilayer Adsorption, Order, Pacs, Palygorskite, Palygorskite Clay, Paper, Particle, Particle Size, Particle Size Analysis, pH, Process, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Rate, Reaction, Reactive Dyes, Sepiolite, Size, Solutions, Sorption, Surface, Water

? Choong, T.S.Y., Chuah, T.G., Robiah, Y., Koay, F.L.G. and Azni, I. (2007), Arsenic toxicity, health hazards and removal techniques from water: An overview. *Desalination*, **217** (1-3), 139-166.

Full Text: [2007\Desalination217, 139.pdf](2007/Desalination217,%20139.pdf)

Abstract: Arsenic contamination in water, especially groundwater, has been recognized as a major problem of catastrophic proportions. The toxicology and health hazard also has been reported for many years. Because of the recognition that arsenic at low concentrations in drinking water causes severe health effects, the technologies of arsenic removal that have become increasing important. The current regulation of drinking water standard is become more stringent and requires arsenic content to be reduced to a few parts per billion. There are several treatment methods capable of this level of performance - membranes, coagulation, anion exchange, disposable iron media, softening etc. Treatment cost, operational complexity of the technology, skill required to operate the technology and disposal of arsenic bearing treatment residual are factors should be considered before treatment method selection. This paper aims to review briefly arsenic toxicology and hazards and also the previous and current available technologies that have been reported in arsenic removal. Residual generation and disposal after treatment will also be discussed.

Keywords: Arsenic, Toxicology, Membrane, Adsorption, Precipitation, Gfh, Residual Disposal, Hydrous Zirconium-Oxide, Zero-Valent Iron, Drinking-Water, Activated Carbon, Aqueous-Solutions, Contaminated Groundwater, United-States, Heavy-Metals, West-Bengal, Nanofiltration Membrane

? Al-Qodah, Z., Lafi, W.K., Al-Anber, Z., Al-Shannag, M. and Harahsheh, A. (2007), Adsorption of methylene blue by acid and heat treated diatomaceous silica. *Desalination*, **217** (1-3), 212-224.

Full Text: [2007\Desalination217, 212.pdf](2007/Desalination217,%20212.pdf)

Abstract: Diatomite, an abundant inorganic material in Jordan, was treated with sulfuric acid and heat treated in order to improve its performance as an adsorbent. The acid treated diatomite (ATD) was used to adsorb methylene blue from aqueous solutions. The equilibrium data were fitted to different adsorption isotherms and the best fit was obtained using Langmuir isotherm with R-2 value of about unity. The maximum loading capacity, Q(max) was found 126.6 mg/g at 30°C and increases slightly as the temperature increases. The kinetics data were best described by the pseudo-second order model with a value of the model constant k(2) of 1.056 (g/mg h) at 30°C and an initial dye concentration of 50 mg/l. The thermodynamic parameters such as the standard enthalpy (ΔH°), standard entropy (ΔS°) and standard free energy (ΔG°) were evaluated. The obtained results indicated the adsorption of basic dyes onto ATD is endothermic and spontaneous process and confirmed the applicability of this modified inorganic material as an efficient adsorbent for basic dyes.

Keywords: Activated Carbons, Adsorbent, Adsorption, Adsorption Isotherms, Aqueous Solutions, Aqueous-Solution, Basic Dyes, Diatomite, Dye, Dyes, Earth, Equilibrium, Equilibrium Models, Ions, Isotherm, Isotherms, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Methylene Blue, Modified Diatomite, Particles, Performance, Pseudo-Second Order, Removal, Sorption

? Chan, L.S., Cheung, W.H. and McKay, G. (2008), Adsorption of acid dyes by bamboo derived activated carbon. *Desalination*, **218** (1-3), 304-312.

Full Text: [2008\Desalination218, 304.pdf](2008/Desalination218,%20304.pdf)

Abstract: Bamboo, indigenous to Hong Kong and China, is widely used as scaffolding in construction and building projects. However, over 50,000 tonnes of bamboo scaffolding waste is disposed as landfill waste each year. Nevertheless, these wastes can be used as raw materials for the production of a range of high value added activated carbons. The bamboo cane can be heated (charred) at a high temperature in the presence of selected activation chemicals to produce activated carbons for various applications e.g. adsorbents, catalysts or catalyst supports. In the present study, activated carbons produced by thermal activation of bamboo with phosphoric acid were used for adsorption of acid dyes. Two acid dyes with different molecular sizes were used, namely Acid Yellow 117 (AY117) and Acid Blue 25 (AB25). It was found that dye with smaller molecular size, AB 25, was readily adsorbed onto the carbon while the larger size dye, AY117, showed little adsorption. It is possible to tailor-make the carbon for the adsorption of dye mixtures in industrial applications, especially textile dyeing. Furthermore, experimental results were fitted to equilibrium isotherm models, Langmuir, Freundlich and Redlich-Peterson.

Keywords: Activated Carbon, Adsorption, Acid Dyes, Bamboo

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Full Text: [2008\Desalination218, 334.pdf](2008/Desalination218,%20334.pdf)

Abstract: The sorption characteristics of nickel and cobalt-organic acid complexes on two commercial chelating resins (Purolite S930 and S950) were compared. Purolite S390 is based on an iminodiacetic funtional group and S950 is an aminophosphonic acid resin. Batch equilibrium adsorption tests of these resins were examined and compared using various metal citrate concentrations (15-2000 mg/L) and solution pH. The solution pH of complex solutions was varied by preparing metal solutions in 0.01, 0. 1, 0.5 and 1.0 M of citric acid. Equilibrium adsorption data were fitted to empirical isotherm models; linear, Langmuir, Freundlich and Redlich-Peterson (R-P) equations to establish the mechanism for the uptake of the metal complexes onto the resins. Our study showed that nickel-citrate complex adsorption exhibited both monolayer and multilayer adsorption; the mechanism on both resins varying with acid concentration, whereas cobalt complex adsorption was independent of acid concentration but the mechanism of metal loading, was found to be influenced by the nature of the resins.

Keywords: Adsorption, Bioleaching, Chelating Resins, Cobalt, Cobalt Citrate, Equilibrium, Freundlich, Isotherm, Isotherms, Langmuir, Laterite Ores, Nickel, Nickel Citrate, Recovery, Resin, Sorption

? Natnasivayam, C. and Sangeetha, D. (2008), Application of coconut coir pith for the removal of sulfate and other anions from water. *Desalination*, **219** (1-3), 1-13.

Full Text: [2008\Desalination219, 1.pdf](2008/Desalination219,%201.pdf)

Abstract: Activated carbon was developed from coconut coir pith using ZnCl2 and investigated to assess the possible use of this adsorbent for the removal of sulfate from water. The influence of various parameters such as agitation time, sulfate concentration, adsorbent dose, pH and temperature has been studied. Equilibrium adsorption data followed both Langmuir and Freundlich isotherms. The Langmuir adsorption capacity (Q(o)) was found to be 4.9 mg/g. Adsorption followed second-order rate kinetics. The per cent adsorption was maximum in the pH range 3.0-9.0 (90-54%) and desorption was higher at pH 2.0 (58-74%) and pH 11.0 (83-97%) for different concentrations of sulfate used in this study. pH effect and desorption studies showed that ion exchange and chemisorption mechanisms were involved in the adsorption process. Delta G(0) was found to be -25.8, -26.2, -27.5 and -28.8 kJ/mol at 35, 40, 50 and 60°C, respectively. ΔS° and ΔH° of adsorption were found to be 132.7 J/K/mol and 15.4 kJ/mol, respectively. Effects of foreign ions on the adsorption of sulfate have been investigated. Removal of sulfate from synthetic ground water was tested. The Langmuir adsorption capacity of other anions such as nitrate, phosphate, vanadate, molybdate, thiocyanate and chromate was also investigated. Results showed that ZnCl2 activated coir pith carbon was effective for the removal of sulfate and other anions from water.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Characteristics, Aqueous-Solution, Carbon, Chitosan, Competitive Adsorption, Desalination, Desorption, Equilibrium, India, Ion Exchange, Ion-Exchange, Isotherms, Kinetics, Langmuir, Molybdate, Netherlands, pH, pH Effect, Phosphate, Phosphate Adsorption, Removal, Science, Sorption, Sulfate, Temperature, Thiocyanate, Waste-Water, Water

? Lata, H., Garg, V.K. and Gupta, R.K. (2008), Adsorptive removal of basic dye by chemically activated Parthenium biomass: Equilibrium and kinetic modeling. *Desalination*, **219** (1-3), 250-261.

Full Text: [2008\Desalination219, 250.pdf](2008/Desalination219,%20250.pdf)

Abstract: This paper reports the removal of a basic dye (rhodamine-B) by the activated carbon prepared from Parthenium biomass by sulphuric acid treatment method (SWC). The effectiveness of the prepared adsorbent has been studied as a function of agitation time, adsorbent dosage, initial dye concentration and pH. The removal of rhodamine-B by SWC followed second order kinetic model. The second order model best describes adsorption kinetic data. Adsorption data were modeled using both Langmuir and Freundlich classical adsorption isotherms. The adsorption capacity Q(0) was 18.52 mg/g at initial pH 7 for the particle size 0.3-1 mm. The equilibrium time is about 60 min for the studied initial dye concentrations. Maximum dye removal (99.2%) was obtained at pH 7 using an adsorbent dose of 16.0 g/L for 50 mg/L dye concentration in the aqueous solution. FT-IR spectra of the adsorbents were recorded to explore the number and position of functional groups available for the binding of dye onto studied adsorbents. The presence of O-H, C=O and C-O groups was identified in the adsorbent. SEMs of the native and exhausted (SWC) were recorded to explore the morphology of the adsorbent.

Keywords: Activated Carbon, Adsorbent, Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption Equilibrium, Adsorption Isotherms, Agricultural Solid-Waste, Aqueous Solution, Aqueous-Solution, Biomass, Brilliant Blue, Carbon, Coir Pith, Congo Red, Desalination, Dye, Equilibrium, FT-IR, FTIR, India, Isotherms, Kinetic, Langmuir, Methylene-Blue, Modeling, Netherlands, Parthenium, pH, Removal, Rhodamine-B, Sawdust, Science, Sem, Size, Sulphuric Acid, Water

? Gök, Ö., Özcan, A.S. and Özcan, A. (2008), Adsorption kinetics of naphthalene onto organo-sepiolite from aqueous solutions. *Desalination*, **220** (1-3), 96-107.

Full Text: [2008\Desalination220, 96.pdf](2008/Desalination220,%2096.pdf)

Abstract: In this study, two activated carbons were prepared from loofa, loofa carbon-1 (LCI) and loofa carbon-2 (LC2). The surface structure of LC1 and LC2 were analyzed by scanning electronic microscopy (SEM). The ability of LC1 and LC2 to remove reactive orange (RO) dye from aqueous solutions by adsorption has been studied. A series of experiments were conducted to assess the effect of system variables such as initial pH, initial metal ion concentration and temperature. The results showed that the adsorption of dye was maximal at the lowest value of pH (pH = 1) and the most suitable sorption temperature was 25°C with maximum capacities of 38.3 and 50 mg/g for LC1 and LC2 respectively. Langmuir, Freundlich, Dubinin-Radushkevich (D-R), Temkin and Harkins-Jura isotherms were used to analyze the equilibrium data at different temperatures. The adsorption kinetics was found to follow a pscudo-first-order rate kinetic model. In addition, various thermodynamic parameters, such as standard Gibbs free energy (ΔG°), standard enthalpy (ΔH°), standard entropy (ΔS°), and activation energy (E-a) have been calculated. The sorption process of reactive orange (RO) dye onto different activated carbons prepared from loofa was found to be spontaneous and exothermic process.

Keywords: Acid Dyes, Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Aqueous Solutions, Carbon Adsorbents, Characterization, Clay, Environmental, Environmental Pollution, Equilibrium, Experimental, Ftir, Kinetic, Kinetics, Model, Model-Calculations, Modification, Modified Montmorillonite, Naphthalene, Organo-Sepiolite, pH, Removal, Smectite, Sorption, Surface Modification, Surfactant, Temperature, Water

? Khawaji, A.D., Kutubkhanah, I.K. and Wie, J.M. (2008), Advances in seawater desalination technologies. *Desalination*, **221** (1-3), 47-69.

Full Text: [2008\Desalination221, 47.pdf](2008/Desalination221,%2047.pdf)

Abstract: A number of seawater desalination technologies have been developed during the last several decades to augment the supply of water in and regions of the world. Due to the constraints of high desalination costs, many countries are unable to afford these technologies as a fresh water resource. However, the steady increasing usage of seawater desalination has demonstrated that seawater desalination is a feasible water resource free from the variations in rainfall. A seawater desalination process separates saline seawater into two streams: a fresh water stream containing a low concentration of dissolved salts and a concentrated brine stream. The process requires some form of energy to desalinate, and utilizes several different technologies for separation. Two of the most commercially important technologies are based on the multi-stage flash (MSF) distillation and reverse osmosis (RO) processes. Although the desalination technologies are mature enough to be a reliable source for fresh water from the sea, a significant amount of research and development (R&D) has been carried out in order to constantly improve the technologies and reduce the cost of desalination. This paper reviews the current status, practices, and advances that have been made in the realm of seawater desalination technologies. Additionally, this paper provides an overview of R&D activities and outlines future prospects for the state-of-the-art seawater desalination technologies. Overall, the present review is made with special emphasis on the MSF and RO desalination technologies because they are the most successful processes for the commercial production of large quantities of fresh water from seawater.

Keywords: Seawater Desalination Technologies, Multi-Stage Flash Distillation Desalination, Multiple-Effect Distillation Desalination, Vapor Compression Distillation Desalination, Reverse Osmosis Desalination, Freezing Desalination, Solar Evaporation Desalination, Potabilization, Desalination Research and Development, Of-the-Art, Msf Distillation Plants, Sea-Water Desalination, Yanbu Al-Sinaiyah, Reverse-Osmosis, Development Program, Solar Desalination, Systems, RO, Pretreatment

? Abdelwahab, O. (2008), Evaluation of the use of loofa activated carbons as potential adsorbents for aqueous solutions containing dye. *Desalination*, **222** (1-3), 357-367.

Full Text: [2008\Desalination222, 357.pdf](2008/Desalination222,%20357.pdf)

Abstract: In this study, two activated carbons were prepared from loofa, loofa carbon-1 (LCI) and loofa carbon-2 (LC2). The surface structure of LC1 and LC2 were analyzed by scanning electronic microscopy (SEM). The ability of LC1 and LC2 to remove reactive orange (RO) dye from aqueous solutions by adsorption has been studied. A series of experiments were conducted to assess the effect of system variables such as initial pH, initial metal ion concentration and temperature. The results showed that the adsorption of dye was maximal at the lowest value of pH (pH = 1) and the most suitable sorption temperature was 25°C with maximum capacities of 38.3 and 50 mg/g for LC1 and LC2 respectively. Langmuir, Freundlich, Dubinin-Radushkevich (D-R), Temkin and Harkins-Jura isotherms were used to analyze the equilibrium data at different temperatures. The adsorption kinetics was found to follow a pscudo-first-order rate kinetic model. In addition, various thermodynamic parameters, such as standard Gibbs free energy (ΔG°), standard enthalpy (ΔH°), standard entropy (ΔS°), and activation energy (E-a) have been calculated. The sorption process of reactive orange (RO) dye onto different activated carbons prepared from loofa was found to be spontaneous and exothermic process.

Keywords: Adsorption, Activated Carbon, Reactive Orange Dye, Loofa, Equilibrium, Thermodynamics, Waste-Water, Adsorption, Removal, Biosorption, Equilibrium, Bagasse, Batch, Ions

? Kabay, N., Sarp, S., Yüksel, M., Kitis, M., Koseoǧlu, H., Arar, Ö., Bryjak, M. and Semiat, R. (2008), Removal of boron from SWRO permeate by boron selective ion exchange resins containing N-methyl glucamine groups. *Desalination*, **223** (1-3), 49-56.

Full Text: [2008\Desalination223, 49.pdf](2008/Desalination223,%2049.pdf)

Abstract: The objective of this study is to explore the performance of the boron selective ion exchange resins for boron removal from seawater reverse osmosis (SWRO) permeate. A lab-scale cross-flow flat-sheet configuration test unit (SEPA CF II, Osrnonics) and FilmTec RO membranes were used for batch-mode RO tests. Seawater samples containing 5.1 mg B/L were collected from the Mediterranean Sea. The chelating ion exchange resins containing N-methyl glucamine groups (Diaion CRB 02 and Dowex-XUS 43594.00 resins) were employed for batch and column-mode tests to remove boron from SWRO permeate. Optimum resin amount for boron removal from SWRO permeate was found as 1 g resin/L for both Diaion and Dowex resins. The equilibrium half-time for B removal was between 30 and 45 min for Dowex and 20-30 min for Diaion resins. Sorption kinetics for these resins fit to Ho pseudo-second-order kinetics model. Both resins exhibited large breakthrough capacities with boron leakage of less than 0.2 mg B/L. Breakthrough capacity was influenced by space velocity. Boron loaded onto the resins was quantitatively eluted with 5% H2SO4 solution.

Keywords: Adsorption, Aqueous-Solution, Boron, Boron Removal, Boron Selective Resins, Breakthrough, Capacity, Desalination, Electrodialysis, Equilibrium, Fly-Ash, Geothermal Waste-Water, Ion Exchange, Ion-Exchange, Kinetics, Kinetics Model, Model, Osmosis, Power-Plant, Pseudo-Second-Order Kinetics, Recovery, Removal, Resins, Reverse Osmosis, Reverse Osmosis (RO), Reverse-Osmosis, Seawater, Seawater, Solution, Sorption, Sorption Kinetics, Sorption-Elution

? Amin, N.K. (2008), Removal of reactive dye from aqueous solutions by adsorption onto activated carbons prepared from sugarcane bagasse pith. *Desalination*, **223** (1-3), 152-161.

Full Text: [2008\Desalination223, 152.pdf](2008/Desalination223,%20152.pdf)

Abstract: Bagasse pith which is the main waste from sugarcane industry in Egypt, has been used as a raw material for the preparation of different activated carbons. Activated carbons were prepared from bagasse pith by chemical activation with 28% H3PO4 (AC1), 50% ZnCl2 (AC2) followed by pyrolysis at 600°C and by physical activation at 600°C in absence of air (AC3). Different activated carbons have been used for the removal of reactive orange (RO) dye from aqueous solutions. Batch adsorption experiments were performed as a function of initial dye concentration, contact time, adsorbent dose and pH. Adsorption data were modeled using the Langmuir and Freundlich adsorption isotherms. Adsorption kinetic data were tested using pseudo-first-order, pseudo-second-order and intraparticle diffusion models. Kinetic studies showed that the adsorption followed pseudo-second-order reaction with regard to the intraparticle diffusion rate.

Keywords: Activated Carbon, Activated Carbons, Activation, Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption Isotherms, Agricultural Waste, Aqueous Solutions, Bagasse Pith, Diffusion, Dye, Dyestuffs, Equilibrium, Experiments, Freundlich, Function, Ions, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Models, pH, Physical Activation, Pore Diffusion, Preparation, Pyrolysis, Reactive Dye, Removal, Sawdust, Sorption

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Full Text: [2008\Desalination223, 162.pdf](2008/Desalination223,%20162.pdf)

Abstract: The effective removal of heavy metals from aqueous wastes is among the most important issues for many industrialized countries. Removal of lead(II) and copper(II) from aqueous solutions were studied using pomegranate peel (raw), activated carbon prepared from pomegranate peel (AC(1)) and activated carbon prepared from chemically treated pomegranate peel (AC(2) and AC(3)). Batch adsorption experiments were performed as a function of pH, contact time, solute concentration and adsorbent dose. The optimum pH required for maximum adsorption were found to be 5.6 and 5.8, for lead and copper respectively. The experimental equilibrium adsorption data are tested for the Langmuir, Freundlich and Temkin equations. Results indicate the following order to fit the isotherms: Langmuir > Temkin > Freundlich in case of lead ions and Freundlich > Temkin > Langmuir in case of copper ions. Adsorption kinetics data were modeled using the pseudo-first and pseudo-second order, Elvoich equations and intraparticle diffusion models. The results indicate that the second-order model best describes adsorption kinetic data.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Adsorption, Adsorption Kinetic, Adsorption Kinetics, Aqueous Solution, Aqueous Solutions, Basic Dye, Biosorption, Cadmium, Carbon, Chromium, Copper, Diffusion, Equilibrium, Experimental, Experiments, Freundlich, Function, Heavy Metals, Heavy-Metals, Isotherms, Kinetic, Kinetics, Langmuir, Lead, Metals, Model, Models, pH, Pomegranate Peel Adsorbent, Pseudo-Second Order, Removal, Solution, Sorption, Wood

? Öztürk, N. and Köse, T.E. (2008), A kinetic study of nitrite adsorption onto sepiolite and powdered activated carbon. *Desalination*, **223** (1-3), 174-179.

Full Text: [2008\Desalination223, 174.pdf](2008/Desalination223,%20174.pdf)

Abstract In this study, the removal of nitrite from aqueous solution by adsorption was investigated. Sepiolite and powdered activated carbon (PAC) were used as adsorbents. In order to investigate the adsorption mechanisms, three simplified kinetic models, i.e., pseudo-first-order, pseudo-second-order and intraparticle diffusion were applied to fit the kinetic data obtained by using sepiolite and PAC. The rate constants for the three models were determined and the correlation coefficients were calculated. Adsorption followed pseudo-second-order rate kinetics for both sepiolite and PAC.

Keywords: Activated Carbon, Adsorbents, Adsorption, Aqueous Solution, Aqueous-Solution, Carbon, Diffusion, Dyes, Ion-Exchange, Kinetic, Kinetic Models, Kinetic Study, Kinetics, Models, Nitrate Removal, Nitrite, Powdered Activated Carbon, Pseudo-Second-Order Rate, Removal, Seplolite, Solution, Waste-Water

? Choi, H.D., Shin, M.C., Kim, D.H., Jeon, C.S. and Baek, K. (2008), Removal characteristics of reactive black 5 using surfactant-modified activated carbon. *Desalination*, **223** (1-3), 290-298.

Full Text: [2008\Desalination223, 290.pdf](2008/Desalination223,%20290.pdf)

Abstract: Reactive dyes are non-degradable and toxic to environments and human being, and their solutions have some color even after wastewater treatment. To remove toxic dyes, adsorption is common choice. In this study, to improve the adsorption capacity, the effect of cationic surfactant was studied to remove reactive black 5 (RB5) by activated carbon (AC) using cetylpyridinium chloride (CPC). Three different ACs were studied; pure AC, AC in CPC solution and precoated AC by CPC. Regardless of surfactant presence, the sorption kinetics followed pseudo-second-order kinetic model. Equilibrium adsorption capacities were determined by fittings experimental data to three well-known isotherm models; Langmuir, Freundlich and double scheme of Langmuir model. A double scheme of Langmuir model was more proper to explain experimental data than the conventional Langmuir and Freundlich model. Cationic surfactant could enhance sorption capacity of RB5 on activated carbon, and the extent of enhancement is highly dependent on pore size distribution of activated carbon.

Keywords: Activated Carbon, Adsorption, Aqueous-Solutions, Capacity, Carbon, Cetylpyridinium Chloride, Chloride, Dyes, Equilibrium, Experimental, Freundlich, Human, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir and Freundlich Model, Model, Models, Reactive Black 5, Reactive Dye, Reactive Dyes, Removal, Size, Sludge, Solution, Sorption, Sorption Kinetics, Surface Modification, Surfactant, Treatment, Wastewater, Wastewater Treatment

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Full Text: [2008\Desalination223, 308.pdf](2008/Desalination223,%20308.pdf)

Abstract: The presence of heavy metals in the aquatic environment has been a big deal to scientists due to their increased discharge, toxic nature, and other adverse effects on receiving waters. Even a very low concentration of lead in water is very toxic to aquatic life. The main sources of lead in water are the effluents of processing industries. Due to the fact that lead poisoning in human causes severe damage to the kidney, nervous system, reproductive system, liver, and brain causes sickness or death. The present research was aimed at the development of clay-based composite as an adsorbent that it can be used in the removal of lead(II) ions by adsorption to obtain equilibrium, kinetics and thermodynamic parameters. In this respect, the monomer, methoxyethylacrylamide (MEA) was synthesized by the nucleophilic substitution reaction of acryloyl chloride with methoxyethylamine. After that clay-poly(methoxyethyl)acrylamide (PMEA) composite was obtained by the bulk polymerization method at +4°C by using N,N-methylenebisacrylamide (MBA) as crosslinker, potassium persulfate (KPS) and tetramethylethylenediamine (TEMED) as the initiator and accelerator, respectively. The surface characterization of both clay and clay-based composite was performed by using the FTIR technique. The experimental results show that the equilibrium contact time was obtained within 60 min and the maximum adsorption capacity was 3.91×10-4 mol g-1 or 81.02 mg g-1. The dynamic data fitted to the pseudo-second-order kinetic model well. The Langmuir isotherm model agrees well with the equilibrium experimental data. The thermodynamic parameters were also deduced for the adsorption of lead(II) ions into clay-based composite and the results show that the adsorption was spontaneous and endothermic.

Keywords: Adsorbent, Adsorption, Aqueous Solutions, Aspergillus-Niger, Biomass, Brain, Capacity, Characterization, Chloride, Clay, Clay-Based Composite, Composite, Copper Ions, Damage, Death, Development, Environment, Environmental Pollution, Equilibrium, Experimental, FTIR, Heavy Metals, Heavy-Metal Biosorption, Human, Isotherm, Isotherms, Kinetic, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Lead, Lead Poisoning, Lead(II), Life, Liver, Metals, Model, Pb(II), Poisoning, Poly(Methoxyethyl)Acrylamide, Polymerization, Removal, Research, Sickness, Sorption, Substitution, Thermodynamic Parameters, Thermodynamics, Tree Fern, Water

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Full Text: [2008\Desalination225, 13.pdf](2008/Desalination225,%2013.pdf)

Abstract: The feasibility of activated carbon prepared from oil palm shell to remove methylene blue from aqueous solutions was investigated through batch and column studies. Batch experiments were carried out to study the adsorption isotherm and kinetics at 30°C, with the initial concentration of 50-500 mg/l and solution pH of 6.5. Equilibrium data were fitted to Langmuir, Freundlich, Temkin and Dubinin-Radushkevich isotherm models. The equilibrium data were best represented by the Langmuir isotherm model, with maximum monolayer adsorption capacity of 243.90 mg/g at 30°C. The adsorption process was found to be exothermic in nature. The kinetic data were fitted to pseudo-first-order, pseudo-second-order and intraparticle diffusion models, and it was found to follow closely the pseudo-second-order model. In column experiments, the effects of the initial dye concentration, bed height and flow rate on methylene blue adsorption were studied. The highest bed capacity of 40.86 mg/g was obtained using 100 mg/l initial dye concentration, 6 cm bed height and 20 ml/min flow rate.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Adsorption Isotherm, Aqueous Solutions, Aqueous-Solutions, Ash, Basic Dye, Batch and Column Studies, Breakthrough Curves, Capacity, Carbon, Column, Column Experiments, Column Studies, Diffusion, Dye, Equilibrium, Equilibrium, Exothermic, Experiments, Fixed Bed, Freundlich, Intraparticle Diffusion, Ions, Isotherm, Isotherm Model, Kinetic, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Methylene Blue, Methylene-Blue, Model, Models, Monolayer, Oil Palm Shell, pH, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Sawdust, Solution, Waste-Water

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Full Text: [2008\Desalination225, 70.pdf](2008/Desalination225,%2070.pdf)

Abstract: The batch removal of Fe3+ from aqueous model solution under different experimental conditions using Jordanian natural zeolite (JNZ) has been investigated. The influences of contact time, metal initial concentration, adsorbent dosage concentration, and temperature have been studied. The adsorption efficiencies are found to be contact time dependent, increasing the contact time in the range of 1-150 min. The sorption equilibrium has attained between 60 and 150 min. The optimum adsorption has taken place at temperature 30°C. The equilibrium adsorption capacity of JNZ adsorbent used for Fe3+ were measured and extrapolated using Langmuir and Freundlich isotherm models and the experimental data are found to fit Langmuir more than Freundlich. ? 2008 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Capacity, Equilibrium, Experimental, Freundlich Isotherm, Ion Exchange, Ion-Exchange, Iron, Iron(III) Ions, Isotherm, Jordanian Natural Zeolite, Langmuir, Langmuir Isotherm, Metal, Model, Models, Removal, Rights, Solution, Sorption, Temperature, Zeolite

? Djeribi, R. and Hamdaoui, O. (2008), Sorption of copper(II) from aqueous solutions by cedar sawdust and crushed brick. *Desalination*, **225** (1-3), 95-112.

Full Text: [2008\Desalination225, 95.pdf](2008/Desalination225,%2095.pdf)

Abstract: In the present study, the aptitudes of cedar (Cedrus atlantica Manatti) sawdust and crushed brick to remove copper(II) ions from aqueous solutions were investigated. Kinetic results and equilibrium removal isotherms were determined. The influence of pH and ionic strength on the sorption of copper was also studied. The removal of copper by both sorbents increased with an increase in contact time and pH (from 1 to 6) and decreased with an increase in ionic strength. Various kinetic models such as the pseudo-first and pseudo-second order rate equations, Boyd model, and external mass-transfer expression were tested. It was concluded that, for both sorbents, copper sorption occurs through a film diffusion mechanism and the kinetic results were best described by the pseudo-second order kinetic model. The equilibrium data has been correlated with both Langmuir and Freundlich isotherms. The results indicate that the Langmuir model fits the data better. The Freundlich model does not lead to a correct determination of the maximum sorption capacity. Thermodynamic parameters such as the changes in free energy, enthalpy, and entropy of sorption of the copper-sorbent systems were also evaluated. The negative values of the change in free energy indicate the feasibility and spontaneous nature of the process, and the negative heats of the change in enthalpy suggest the exothermic nature of the process. Additionally, different types of chemical treatments were applied: alkaline treatments (NaOH, KOH), acidic treatments (H2SO4, H3PO4, CH3COOH), treatments with mineral salts (NaCl, KCl, Na2HPO4, NaHCO3), treatment with urea, and phosphorylation treatment (urea + H3PO4) in order to enhance the sorption aptitudes of the both sorbents. Among the studied chemical treatments applied, treatments with mineral salts (Na2HPO4, KCl, NaCl, and NaHCO3) for crushed brick and alkaline treatments by NaOH and KOH for cedar sawdust were the most effective.

Keywords: Activated Carbon, Adsorption, Aqueous Solutions, Capacity, Cedar Sawdust, Changes, Chemical Treatments, Copper, Copper(II), Crushed Brick, Diffusion, Enthalpy, Entropy, Equilibrium, Exothermic, Expression, Freundlich, Freundlich Model, Heavy-Metal, Industrial-Wastes, Ionic Strength, Ions, Isotherm, Isotherms, KCl, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Kinetics, Koh, Langmuir, Langmuir and Freundlich Isotherms, Langmuir Model, Lead, Mass Transfer, Mechanism, Model, Models, Nacl, Naoh, Particles, pH, Pseudo Second Order, Pseudo-First and, Pseudo-Second Order, Pseudo-Second-Order, Remediation, Removal, Salts, Sawdust, Sorbents, Sorption, Sorption Capacity, Technologies, Thermodynamic, Thermodynamic Parameters, Treatment

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Full Text: [2008\Desalination225, 185.pdf](2008/Desalination225,%20185.pdf)

Abstract: The adsorption studies of 4-chlorophenol from aqueous solution on activated carbon derived from rattan sawdust (RSAC) have been analyzed in the range of 25-200 mg/L initial 4-chlorophenol concentrations and at temperature 28°C. Different experimental parameters like initial pH, contact time and initial concentration on the adsorption of 4-chlorophenol were evaluated. Langmuir, Freundlich, Redlich-Peterson, Temkin and Dubinin-Radushkevich isotherm models were used to illustrate the experimental isotherms and isotherms constants. Equilibrium data fitted very well with the Langmuir isotherm model. The rates of adsorption were found to obey the rules of pseudo-second order model with good correlation. Results of the intra-particle diffusion model show that the pore diffusion is not the only rate limiting step.

Keywords: 4-Chlorophenol, Activated Carbon, Adsorption, Adsorption Isotherm, Aqueous Solution, Aqueous-Solutions, Basic Dye, Carbon, Diffusion, Diffusion Model, Equilibrium, Experimental, Freundlich, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Ions, Isotherm, Isotherm Model, Isotherms, Kinetics, Langmuir, Langmuir Isotherm, Mechanism, Methylene-Blue, Model, Models, pH, Phenolic-Compounds, Pore Diffusion, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Rate Limiting Step, Rattan Sawdust, Redlich-Peterson, Removal, Sawdust, Solution, Sorption, Temperature, Waste-Water, Wastewaters

? Srihari, V. and Das, A. (2008), The kinetic and thermodynamic studies of phenol-sorption onto three agro-based carbons. *Desalination*, **225** (1-3), 220-234.

Full Text: [2008\Desalination225, 220.pdf](2008/Desalination225,%20220.pdf)

Abstract: In the present investigation, adsorption kinetics of phenol from aqueous media onto three agro-based adsorbents, namely Black Gram Husk (BGH), Green Gram Husk (GGH) and Rice Husk (RH), were carried out. The pseudo-first-order, Bhattacharya and Venkobachar, Natarajan and Khalaf, power function model, second-order kinetic model and intraparticle diffusion model were used to describe the kinetic data to estimate the rate constants. Free energy of adsorption (ΔG0), enthalpy (ΔH0), and entropy (ΔS0) changes were calculated to predict the nature of adsorption. The estimated values of ΔG0 for the agrowastes used were found to be low (-90.4267 kJ/mol K), thus, indicating spontaneity of the process. The negative value of ΔH0 (lowest BGH -42.36 kJ/mol and highest for RH - 34.31 kJ/ mol) will indicate the process is exothermic and the sorption behavior may be physio-sorption in nature. The positive values of ΔS0 of all the three agro-based adsorbents (range 0.11-0.14 J/mol K) shows the increased randomness at the solid/solution interface during the adsorption process. © 2008 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption Kinetics, Basic Dye, Behavior, BGH, Changes, Diffusion, Diffusion Model, Elovich Equation, Enthalpy, Entropy, Exothermic, Function, GGH and RH, Intraparticle Diffusion, Intraparticle Diffusion Model, Investigation, Ions, Kinetic, Kinetic Model, Kinetics, Kinetics of Adsorption, Liquid-Phase Adsorption, Media, Model, Phenol, Pseudo-First-Order, Randomness, Rate Constants, Removal, Second Order, Second-Order, Soils, Sorption, Temperature, Thermodynamic, Thermodynamic Studies, Thermodynamics, Water

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Full Text: [2008\Desalination227, 190.pdf](2008/Desalination227,%20190.pdf)

Abstract: The potentialities of castor seed shell (CSS), a waste agricultural by-product, in the remediation of water, contaminated with Methylene Blue (MB), a basic dye, were investigated in the present study. The CSS was ground and washed, thoroughly, to remove any water extractable constituents. The dried CSS was reground, sieved and used in series of agitated batch adsorption experiments. The experiments were conducted to assess the effect of two process variables i.e. initial MB concentration and CSS dosage on the sorption process. The equilibrium sorption isotherm was studied using the two widely used isotherm models (i.e. Freundlich and Langmuir isotherm models). The results from the isotherm studies showed that the process of sorption of MB occurred on a heterogeneous surface of the CSS. The sorption capacity of the CSS, as obtained from the Langmuir plot was 158 mg/g. The mass transfer property of the sorption process was studied using Lagergren pseudo-first-order and chemisorptions pseudo-secondorder kinetic models. The sorption process obeyed the pseudo-second-order kinetic model more than the pseudo-first order; hence the mechanism of the sorption process was analysed further using this kinetic model. The application of the intraparticle diffusion model to determine the rate limiting step showed that intraparticle diffusion is not the singular rate limiting step in the sorption of MB onto CSS. The role of chemisorptions in the mechanism of sorption was established by an empirical relationship between the pseudo-second-order rate constant, K, and the initial MB concentration. The results of this relationship showed that pseudo-second-order chemisorptions are important in the sorption process. © 2008.

Keywords: Adsorbents, Adsorption, Adsorption, Aqueous-Solutions, Basic Dye, Castor Seed Shell, Color Removal, Dye, Equilibrium, Intraparticle, Isotherm, Kinetics, Lead, Methylene Blue, Model, Pseudo, Sorption, Textile Effluents

? Jha, M.K., Upadhyay, R.R., Lee, J.C. and Kumar, V. (2008), Treatment of rayon waste effluent for the removal of Zn and Ca using Indion BSR resin. *Desalination*, **228** (1-3), 97-107.

Full Text: [2008\Desalination228, 97.pdf](2008/Desalination228,%2097.pdf)

Abstract: Zinc is an important non-ferrous metal which finds application in different industries viz. electroplating, metal finishing, textile, galvanising etc. These industries generate effluents containing zinc during processing. The discharge of these effluents not only pollutes the environment but also affects health. In the present Studies, an ion exchange process has been used to remove zinc and calcium from the synthetic and actual rayon waste effluent using chelating ion exchange resin, Indion BSR. Various parameters viz. contact time, pH of the Solution, resin dose, kinetics of extraction, acid concentration for elution etc., have been Studied for zinc recovery from the effluent. Extraction of zinc from the aqueous feed by Indion BSR was found to increase with increase in time, pH of the solution and resin dose. Total zinc loaded in the resin was found to be 91.0 mg Zn/g resin under the saturation loading from the aqueous feeds of 0.5 mg Zn/mL at pH 5.3. The data for adsorption of zinc were found to be fitted well for both the adsorption isotherm, the Lagmuir as well as the Freundlich and second-order-rate equations. The eluted solution could be used for recovery/recycling of zinc by electrolysis/crystallization after purification of the concentrated solution. The raffinate obtained after the recovery of zinc could be disposed safely Without affecting the environment.

Keywords: Adsorption, Adsorption Isotherm, Application, Aqueous-Solution, Biosorption, Calcium, Chelating Resin, Concentration, Data, Discharge, Effluents, Elution, Environment, Extraction, Feed, Freundlich, Health, Heavy-Metals, Ion Exchange, Ion-Exchange, Ion-Exchange Equilibria, Isotherm, Kinetics, Loading, Metal, Nickel(II), pH, Purification, Rayon Effluent Treatment, Recovery, Removal, Resin, Saturation, Solution, Technology, Treatment, Waste, Water, Zinc, Zinc Recovery

? Ren, Y., Zhang, M. and Zhao, D. (2008), Synthesis and properties of magnetic Cu(II) ion imprinted composite adsorbent for selective removal of copper. *Desalination*, **228** (1-3), 135-149.

Full Text: [2008\Desalination228, 135.pdf](2008/Desalination228,%20135.pdf)

Abstract: A new magnetic Cu(II) ion imprinted composite adsorbent (CU(II)-MICA) was synthesized with waste fungal mycelium from industry, chitosan (CS) and Fe3O4 nanoparticles combining metal imprinting technology. It was compared with its corresponding single component and magnetic non-imprinted composite adsorbent (MNICA). Batch adsorption studies were performed to evaluate adsorption isotherm, adsorption selectivity, adsorption kinetics, magnetic settlement and desorption characters. The Langmuir adsorption isotherm fit well in the experimental equilibrium data. The maximum sorption calculated from the Langmuir isotherm was 71.36 mg/g and 44.78 mg/g for Cu(II)-MICA and MNICA in their sole Cu(II) solution at 25°C and pH 5.5. Competitive sorption, of multi-ions studies indicated that the Cu(II)-MICA had high single selectivity sorption for Cu(II). It showed metal ion affinity in the competitive conditions of Cu(II)>Zn(II)>Co(II)>Ni(II). Kinetics studies showed that the adsorption process obeyed pseudo-second-order rate mechanism with an initial adsorption rate of 253.2 and 198.0 mg/g min for Cu(I I)MICA and Cu(II)-MNICA, respectively. Results showed that Cu(II)-MICA was a material of efficient, low-cost, convenient separation under additional magnetic field and could be reused for five times with about 14-15% regeneration loss.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Adsorption Rate, Aqueous-Solutions, Biosorption, Chitosan, Competitive, Composite, Copper, Cu(II), Cu(II) Ion, Cu(II) Ion Imprinted, Data, Desorption, Equilibrium, Experimental, Fe3O4, Fe3O4 Magnetic Nanopaticels, Field, Isotherm, Kinetics, Langmuir, Langmuir Adsorption Isotherm, Langmuir Isotherm, Magnetic, Magnetic Field, Mechanism, Metal, Metal Ion Imprinted, Metal-Ions, Nanoparticles, pH, Polymers, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Regeneration, Removal, Resin, Sawdust, Selective Removal, Separation, Solution, Sorption, Technology, Waste

? Zhao, H., Vance, G.F., Ganjegunte, G.K. and Urynowicz, M.A. (2008), Use of zeolites for treating natural gas co-produced waters in Wyoming, USA. *Desalination*, **228** (1-3), 263-276.

Full Text: [2008\Desalination228, 263.pdf](2008/Desalination228,%20263.pdf)

Abstract: Fast development of the coalbed natural gas (CBNG) industry in many parts of the western US has resulted in the co-production of potentially saline-sodic waters, hereafter referred to as CBNG water. Management of CBNG water is a major environmental challenge because of its quantity and quality. Ill this Study, the potential utilization of three calcium (Ca2+)-rich zeolites were examined for removal of sodium (Na+) from CBNG waters. The zeolite samples examined were from the St. Cloud (ST) mine in Winston, NM, the Bear River (BR) mine in Preston, ID, and a mine in Arizona (AZ). The zeolite materials were used in adsorption and column experiments to evaluate sorption as a function of water chemistry, particle size and flow rate. Regeneration and potential reuse of the media were also examined. Surrogate CBNG waters that simulated the water chemistry of CBNG waters were used in the different studies. Although the AZ-zeolite is a Ca2+-rich chabazite, results from column studies indicate there was essentially no Na+ exchange, suggesting the Ca2+ is tightly held on chabazite adsorption sites. Results for ST-zeolite and BR-zeolite, which are clinoptilolite zeolites, indicated that a Langmuir model fit the adsorption data well. The maximum adsorption capacities from the adsorption curves for ST-zeolite and BR-zeolite were 9.6 and 12.3 (mg/g), respectively, accounting for approximately 38% and 39% of their measured CEC values. Column studies indicated that a metric tonne (1,000 kg) of ST-zeolite and BR-zeolite can be used to accumulatively treat 16,000 and 60,000 L of CBNG water, respectively, in order to lower the sodium adsorption ratio (SAR, mmol(1/2)L(-1/2)) of the simulated CBNG water from 30 to an acceptable level of 10. Based on the results of this study, Na+ removal with clinoptilolite zeolite appears to be a potential water treatment technology for maximizing the beneficial use of poor-quality CBNG water. Ongoing studies are evaluating water treatment techniques involving the direct application of zeolite to CBNG waters and development of a field scale prototype.

Keywords: Adsorption, Adsorption Capacities, Application, Arizona, Calcium, Chabazite, Challenge, Chemistry, Clinoptilolite, Coalbed Methane Co-Produced Water, Column, Column Experiments, Column Studies, Data, Development, Environmental, Experiments, Field, Flow, Function, Langmuir, Langmuir Model, Media, Model, Na+, Natural Gas, Nm, Particle Size, Potential, Powder River Basin, Quality, Removal, Reuse, SAR, Scale, Size, Sodic-Saline Water, Sodium, Sodium Adsorption Ratio, Sorption, Techniques, Technology, Treatment, US, USA, Utilization, Water, Water Chemistry, Water Treatment, Waters, Zeolite, Zeolites

? Šćiban, M., Klašnja, M. and Škrbić, B. (2008), Adsorption of copper ions from water by modified agricultural by-products. *Desalination*, **229** (1-3), 170-180.

Full Text: [2008\Desalination229, 170.pdf](2008/Desalination229,%20170.pdf)

Abstract: The efficiency of raw wheat and soybean straws, corn stalks and corn cobs in removing different heavy metal ions from simulated contaminated water was studied. The investigated adsorbents have shown different adsorption capacities for copper, nickel, cadmium and lead ions. All of them, except for corn cobs, adsorbed copper ions well. Corn cob and wheat straw adsorbed cadmium and nickel ions well. As for lead ions soybean straw and corn stalks showed good adsorption capacity. In order to increase the adsorption capacities and decrease the leaching of extractive matters from all investigated biomasses, they were modified with (1) formaldehyde in acidic medium, (2) sodium hydroxide both with and Without previous modification with formaldehyde, (3) acid Solution or (4) only were water-washed. The effects of these treatments were evaluated in copper adsorption experiments. Treatments with formaldehyde, sulphuric acid and 5% NaOH were not advisable for investigated adsorbents. Adsorbents modification with 1% NaOH or water washing adsorbents gave good results, but the native (raw) materials were still quite efficient. In order to prevent organic matters leaching from biomasses during adsorption the washing of lignocellulosic materials is applied as it is the cheapest and the most suitable process.

Keywords: Heavy Metals, Adsorption, Agricultural By-Products, Modification, Heavy-Metal Ions, Waste-Water, Aqueous-Solutions, Removal, Adsorbents, Biosorption, Wood, Lead(II), Sorption, Sawdust

? Gong, R.M., Zhu, S.X., Zhang, D.M., Chen, J., Ni, S.J. and Guan, R. (2008), Adsorption behavior of cationic dyes on citric acid esterifying wheat straw: Kinetic and thermodynamic profile. *Desalination*, **230** (1-3), 220-228.

Full Text: [2008\Desalination230, 220.pdf](2008/Desalination230,%20220.pdf)

Abstract: The kinetic and thermodynamic behaviors of cationic dye adsorption onto citric acid esterifying wheat straw (EWS) from aqueous solution were investigated. Two cationic dyes, methylene blue (MB) and crystal violet (CV) were selected as adsorbates. The kinetic and thermodynamic parameters of dye adsorption were examined with a batch system by changing various experimental factors (e.g. initial pH, EWS dosage, dye concentration, contact time, temperature). The MB and CV removal ratios came up to the maximum value beyond pH 4. The 2.0 g/L group of EWS could almost completely remove MB and CV from 250 mg/L of dye solution. The adsorption percentages of MB and CV kept above 95% over a range from 50 to 350 mg/L of dye concentration when 2.0 g/L of EWS was used. The isothermal data followed the Langmuir model. The adsorption processes could be described by the pseudo-second-order kinetic model. The dual linear plots of intraparticle diffusion indicated that two intraparticle diffusion steps occurred in the dye adsorption processes. The thermodynamic study indicated that the adsorptions of dyes were spontaneous and endothermic. High temperatures favored the adsorption processes.

Keywords: Adsorption, Aqueous Solution, Aqueous-Solution, Batch, Batch System, Behavior, Cationic Dye, Cationic Dyes, Citric Acid, Concentration, Crystal Violet, Data, Degradation, Diffusion, Dye, Dye Adsorption, Dyes, Dyestuffs, Endothermic, Equilibrium, Experimental, Intraparticle Diffusion, Isothermal, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Model, MB, Methylene Blue, Methylene-Blue, Model, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Reactive Dyes, Removal, Rice Husk, Solution, Sorption, Straw, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Value, Waste-Water

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Full Text: [2008\Desalination230, 288.pdf](2008/Desalination230,%20288.pdf)

Abstract: Boron removal from boron containing wastewaters prepared synthetically via the electrocoagulation method was studied. The experiments in which aluminum plate electrode was used were carried out in a batch reactor. The solution pH, initial boron concentration, current density, type of supporting electrolyte, temperature of solution and stirring speed were selected as experimental parameters. The obtained experimental results showed that efficiency of boron removal increased with increasing current density and decreased with increasing boron concentration in the solution. Supporting electrolyte had not significant effects on the percent of total boron removal. pH was very important parameter effecting boron removal and optimum pH was determined to be 8.0. This pH value reached an agreement with activity-pH diagrams for Al3+ species in equilibrium with Al(OH)3 and boron species in aqueous media. As a result of increasing interaction between boron ions and dissolved aluminum ions in solution, the increasing solution temperature increased boron removal efficiency. Increasing stirring speed decreased boron removal efficiency where the increasing stirring speed decreased the capability of floc formation of aluminum ions. As a result, it was seen that about 99% of boron in the wastewater could be removed at optimum conditions. In addition, the process kinetics was predicted by using heterogeneous fluid-solid reaction models. It was seen statistically that the kinetics of this process agreed with the pseudo-second-order model as follows: X-B/(1-X-B) = 18,241\*[OH]\*[C](-3.45)\*[CD](7.79)\*[t](1.41)\*[S](-3.65)\*exp[-30,668/R\*T].

Keywords: Adsorption, Aluminum, Aluminum Electrode, Batch, Batch Reactor, Boron, Boron Removal, Concentration, Dissolved, Efficiency, Electrocoagulation, Empirical Kinetics Model, Equilibrium, Experimental, Experiments, Interaction, Ion-Exchange, Ions, Kinetics, Media, Model, Models, pH, pH Value, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Removal Efficiency, Solution, Species, Temperature, Value, Waste-Water Treatment, Wastewater, Wastewaters

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Full Text: [2008\Desalination234, 116.pdf](2008/Desalination234,%20116.pdf)

Abstract: Ultrafiltration (UF) separation of hemoglobin (Hb, pI 7.1, MW 68,000) and bovine serum albumin (BSA, pI 4.7, MW 67,000) in aqueous Solutions With PES (polyethersulfone, MWCO = 100 kDa) and PAN (polyacrylonitrile, MWCO = 100 kDa) membranes was studied. Experiments were performed by changing operating parameters including Solution pH (4-7.5), initial protein concentration (100-500 ppm), transmembrane pressure (TMP, 10-50 psi), ionic strength (0.01-0.1 M), and stirring speed (100-300 rpm). More effective separation was achieved at a lower protein concentration, I lower TMP, or a pH above the pI of Hb with PAN membrane. Under the conditions of low pressure, low protein concentration, and low ionic strength, the interactions between the charges of proteins and membranes were important. The flux decreased more sharply when pH was lower than 7.1. Response surface methodology by the Box-Behnken model was used to examine the role of each process variable on protein rejection and UF flux. A second-order polynomial regression model could properly interpret the experimental data with an R2 value of 0.97, based on the estimated rejection of BSA LIP to 99.7%. Interactions between these operating parameters and the significance effects on UF operation were also discussed.

Keywords: Adsorption, Albumin, Aqueous Solutions, Bovine, Bovine Serum Albumin, BSA, Concentration, Critical Flux, Cross-Flow Ultrafiltration, Data, Dead-End Ultrafiltration, Effects, Experimental, Filtration, Flux Decline, Fractionation, Hemoglobin, Interactions, Ionic Strength, Membrane, Membranes, Methodology, Microfiltration, Model, Operating Parameters, Operation, pH, Pressure, Process, Protein, Proteins, Regression, Regression Model, Rejection, Response Surface Methodology, Role, Second Order, Second-Order, Separation, Serum, Significance, Solution pH, Solutions, Strength, Surface, UF, Ultrafiltration, Value

? Benguella, B. and Yacouta-Nour, A. (2009), Adsorption of Bezanyl Red and Nylomine Green from aqueous solutions by natural and acid-activated bentonite. *Desalination*, **235** (1-3), 276-292.

Full Text: [2009\Desalination235, 276.pdf](2009/Desalination235,%20276.pdf)

Abstract: The adsorption of two acid dyes, namely, Red Bezanyl and Green Nylomine, onto natural bentonite and acid activated bentonite from aqueous solutions were Studied in a batch system. The kinetic data show that at the equilibrium, the acid-activated bentonite fixes more Bezanyl Red and Nylomine Green than the natural bentonite. Adsorption equilibrium was reached within 2 h. The results also showed that the kinetics of adsorption is best descibed by a pseudo second-order expression than a first or second-order model. Adsorption isotherms of acid dyes onto bentonite and acid-activated bentonite were determined and correlated with common isotherm equations such as the Langmuir and Freundlich models. The Langmuir model agrees very well with the experimental data. For better explanation of these results, the natural bentonite and acid-activated bentonite have been examined in detail through FTIR, BET and XRD analyses.

Keywords: Adsorption, Bentonite, Activated Bentonite, Acid Dyes, Kinetics, Equilibrium, Methylene-Blue, Reactive Dyes, Removal, Clays, Adsorbents, Carbon, Organobentonite, Montmorillonite, Surfactants, Diffusion

? Khaled, A., El Nemr, A., EI-Sikaily, A. and Abdelwahab, A. (2009), Treatment of artificial textile dye effluent containing Direct Yellow 12 by orange peel carbon. *Desalination*, **238** (1-3), 210-232.

Full Text: [2009\Desalination238, 210.pdf](2009/Desalination238,%20210.pdf)

Abstract: The use of low-cost and eco-friendly adsorbents has been investigated as an ideal alternative to the current expensive methods of removing dyes from wastewater. Orange peel was collected from the local fields of orange trees and converted into a low-cost adsorbent. The present study deals with the removal of textile dyes from artificial textile dye effluent by activated carbons developed from orange peel. Direct Yellow 12 (DY-12) was used as the model compound due to its wide range of applications and high stability in the environment. The maximum removal was 96% for 125 mg l-1 of DY-12 concentration on 5 g l-1 carbon concentration. The effect of initial dye concentration (25-125 mg l-1), pH, contact time, and concentration of orange peel carbon (2.5-10.0 g l-1) have been studied at 27±2°C. Several isotherm models, Langmuir, Freundlich, Koble-Corrigan, Redlich-Peterson, Tempkin, Dubinin-Radushkevich and generalized isotherm equations, were investigated and all of them were in good agreement with the experimental data except Redlich-Peterson. The results indicate that acidic pH (1.5) supported the adsorption of DY-12 on activated carbon developed from orange peel. Furthermore, adsorption kinetics of DY-12 was studied and the rate of sorption was found to conform to pseudo-second-order kinetics with correlation coefficients equal unity under all studied conditions. The maximum adsorption capacity calculated from the Langmuir isotherm model was 75.76 mg g-1. The activated carbon obtained from orange peel via acid decomposition has been found to be an efficient material for dye removal from artificial textile dye effluent owing to its very low cost.

Keywords: Activated Carbon, Activated Carbon, Adsorption, Adsorption, Alga Ulva-Lactuca, Aqueous-Solutions, Biosorption, Direct Yellow 12, Equilibrium, Isotherm, Kinetics, Metal-Ions, Methylene-Blue, Orange Peel, Removal, Textile Dyes, Waste-Water

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Full Text: [2009\Desalination242, 19.pdf](2009/Desalination242,%2019.pdf)

Abstract: The objective of this Study was to investigate the removal of phenol from aqueous solution by using acid activated red mud in batch adsorption experiments. The Study was carried out as functions of pH, contact time, activated red mud dosage and initial phenol concentration. It was found that the maximum removal was obtained at pH below 8 and the adsorption equilibrium time was 10 h. Adsorption was followed the pseudo second-order kinetic model. According to the coefficient of determination and non-linear regression analysis carried Out by Chi-square test, the Langmuir isotherm better represented the adsorption data in comparison to the Freundlich isotherm. The phenol adsorption capacity of the activated red mud (8.156 mg/g) was found to be higher than that of the neutralized red mud (4.127 mg/g) at pH 6 and 25±1°C. Negative ΔG° value (-22.692 kJ/mol) indicated that the adsorption of phenol onto the activated red Mud was spontaneous and feasible process.

Keywords: Acid Activation, Activated Red Mud, Adsorption, Aluminum-Industry Waste, Aqueous-Solution, Arsenate, Bagasse Fly-Ash, Langmuir, Lead(II) Adsorption, P-Nitrophenol, pH, Phenol Removal, Removal, Sorption, Sugar-Industry, Water

? Baker, H.M. (2009), A study of the binding strength and thermodynamic aspects of cadmium and lead ions with natural silicate minerals in aqueous solutions. *Desalination*, **242** (1-3), 115-127.

Full Text: [2009\Desalination242, 115.pdf](2009/Desalination242,%20115.pdf)

Abstract: Batch sorption experiments were conducted with cadmium and lead ions at low equilibrium concentrations in 0.01 M of NaNO3 onto Petra clay in single component systems. The equilibrium isotherms were determined at pH 6 under constant ionic strength and at different temperatures. The experimental data were analyzed using the Langmuir, Temkin, Dubinin-Kaganer-Radushkevich, Freundlich and Redlich-Peterson isotherm models. From the Langmuir isotherm, the equilibrium adsorption capacity for Cd2+ is 74.074-144.927 mg g-1 and that for Pb2+ is 83.333-263.158 mg g1. It therefore showed that Petra clay which was mainly composed of 20% of kaolinite and 55% of calcium montmorillomite exhibited higher selectivity for Pb2+ whereas its selectivity for Cd2+ was often lower at all concentrations applied. From the R-2 values for the five isotherm models it was found that the sorption was good for the two metal ions and the good correlation confirms the formation of a monolayer of Cd2+ and Pb2+ on the Surface of the clay. The derived constants and their temperature dependencies were used to calculate the corresponding thermodynamic parameters. The Langmuir isotherm, Temkin isotherm and Dubinin-Kaganer-Radushkevich isotherms analysis showed that the binding for these metal ions with Petra clay minerals was physisorption in its nature with an endothermic process derived from very favorable entropy.

Keywords: Activated Carbon, Adsorption Behavior, Cadmium and Lead Removal, Clay, Clay, Clay Minerals, Complexation, Desorption, Exchange Method, Insolubilized Humic-Acid, Isotherm Models, Lead, Montmorillonite, Removal, Sorption, Thermodunamics

? Demirbas, E. and Nas, M.Z. (2009), Batch kinetic and equilibrium studies of adsorption of Reactive Blue 21 by fly ash and sepiolite. *Desalination*, **243** (1-3), 8-21.

Full Text: [2009\Desalination243, 8.pdf](2009/Desalination243,%208.pdf)

Abstract: Adsorption of Reactive Blue 21 (RB21) onto fly ash (FA) and sepiolite from aqueous solutions was investigated. Batch adsorption experiments were carried out to evaluate the influences of experimental parameters such as initial dye concentration (100-750 mg/l), pH (2-8), adsorbent dosage (1-4 g/1) and temperature (298-323 K) on the adsorption process. The optimum conditions for RB21 removal were pH 2, 1 g/1 of adsorbent dosage and equilibrium time of 16 h, respectively. Results of the kinetic studies showed that RB21 dye onto FA and sepiolite were best described by the pseudo-second-order kinetic model. The Langmuir isotherm provided the best correlation for RB21 dye onto FA and sepiolite. The maximum (lye adsorption capacities of R1321-FA and R1321-sepiolite from the Langmuir isotherm model at 323 K were 106.71 mg/g and 66.67 mg/g, respectively. Thermodynamics parameters, ΔG°, ΔH° and ΔS°, were calculated. The values of enthalpy were found as 35.76 H/mol for FA and 35.08 J/mol K for sepiolite, respectively, indicating that this process was endothermic in nature.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacities, Aqueous Solutions, Aqueous-Solutions, Basic Dye, Batch Adsorption, Concentration, Congo Red, Correlation, Dye, Endothermic, Enthalpy, Equilibrium, Equilibrium Studies, Experimental, Experiments, Fly Ash, Isotherm, Isotherm Analyses, Isotherm Model, Isotherms, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Low-Cost Adsorbents, Model, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Reactive Dye, Removal, Sawdust, Sepiolite, Solutions, Temperature, Thermodynamics, Waste, Water

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Full Text: [2009\Desalination243, 109.pdf](2009/Desalination243,%20109.pdf)

Abstract: The leaf sheath fibres of the Mediterranean seagrass Posidonia oceanica (L.) were used as low cost, available and renewable biological adsorbent for the removal of a metal complex textile dye from aqueous solutions. Batch experiments were carried out for sorption kinetics and isotherms. Operating variables studied were exposure time, pH and biomass dosage. Maximum color removal was observed at pH 2. Biosorption capacity was enhanced by increasing biomass quantity up to 10 g/L. Experimental sorption kinetic data were fitted to Lagergren irreversible first-order, reversible first-order, pseudo-second-order and Elovich models and rate constants were estimated. The related data were found to follow the pseudo-second-order and Elovich equations, thereby predicting a chemisorption process. Besides, equilibrium data were well represented by both Redlich-Peterson and Langmuir isotherm models, suggesting a monolayer coverage of dye molecules onto the marine biomass surface and adsorption active sites of quite similar affinities toward the experimental textile pollutant.

Keywords: Acid Dyes, Activated Carbon, Adsorbent, Adsorption, Adsorption, Aqueous Medium, Aqueous Solutions, Batch System, Biological, Biomass, Biosorption, Capacity, Chemisorption, Color Removal, Cost, Coverage, Data, Dye, Elovich, Equilibrium, Experimental, Experiments, Exposure, First Order, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Low Cost, Mediterranean, Metal, Metal Complex Dye, Methylene-Blue, Modelling, Models, Monolayer, pH, Posidonia Oceanica, Pseudo Second Order, Pseudo-Second-Order, Rate Constants, Reactive Dye, Redlich-Peterson, Removal, Solutions, Sorption, Sorption Kinetics, Sorption Kinetics and Isotherms, Surface, Textile Dye

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Full Text: [2009\Desalination244, 48.pdf](2009/Desalination244,%2048.pdf)

Abstract: This paper describes the interaction and removal of some heavy metal ions such as Ni(II) and Cu(II) from aqueous solution at constant pH (6.0) and 0.01 M NaClO4 ionic strength using raw clay mineral. The experimental results were analysed in terms of Langmuir, Freundlich and Redlich-Peterson isotherms to obtain the characteristic parameters of each model. Both the Langmuir and Redlich-Peterson isotherms were found to represent the measured sorption data. The Langmuir monolayer adsorption capacity was found to range from 48.54 to 60.98 and 58.48 to 69.93 mg metal ion/g clay for Ni(II) and Cu(II) respectively. Also thermodynamic parameters such as enthalpy (ΔH), free energy (ΔG) and entropy (ΔS) were calculated and these values show that adsorption of heavy metal ions on clay was an endothermic, entropically driven with very favorable entropy and spontaneous process. The values of ΔG indicate that the adsorption is characterized by physical adsorption. According to the equilibrium studies, the selectivity sequence can be given as Cu(II) > Ni(II). These results show that natural clay holds great potential to remove cationic heavy metal species from aqueous solutions.

Keywords: Adsorption, Adsorption, Adsorption Capacity, Aqueous Solution, Aqueous Solutions, Capacity, Characterization, Clay, Clay Mineral, Copper(II), Cu(II), Data, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Studies, Experimental, Freundlich, Heavy Metal, Heavy Metal Ions, Heavy-Metals, Insolubilized Humic-Acid, Interaction, Ion-Exchange Method, Ionic Strength, Ions, Isotherms, Langmuir, Lead Ions, Metal, Metal Ions, Metal-Ions, Minerals, Model, Monolayer, Natural, Natural Clay, Ni(II), Nickel(II), pH, Physical, Potential, Redlich-Peterson, Removal, Selectivity, Silicate, Solution, Solutions, Sorption, Species, Strength, Thermodynamic, Thermodynamic Parameters, Tree Fern

? Akar, S.T., Yetimoglu, Y. and Gedikbey, T. (2009), Removal of chromium (VI) ions from aqueous solutions by using Turkish montmorillonite clay: Effect of activation and modification. *Desalination*, **244** (1-3), 97-108.

Full Text: [2009\Desalination244, 97.pdf](2009/Desalination244,%2097.pdf)

Abstract: This study provides information on the Cr(VI) adsorption potential of Turkish (Mihaliccik region) montmorillonite clay as an abundant, cost-effective and untried material. Batch adsorption trials of chromium were performed to investigate the effects of pH, contact time, and initial metal ion concentration. The adsorption was solution pH dependent and the maximum adsorption was observed at a solution pH of 1.0. Adsorption equilibrium was established in 7 h. Langmuir, Freundlich and Dubinin-Radushkevich isotherm models were used to evaluate the equilibrium data at 20°C and regression coefficients were derived. Adsorption kinetics was analyzed using the first-order and the pseudo-second-order kinetic models. Also, the effects of activation and modification on the adsorption capacity of clay were investigated under optimum conditions. Adsorption capacity of modified clay with hexadecyltrimethylammonium bromide was higher than that of acid and heat treated ones.

Keywords: Activation, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Adsorption Kinetics, Aqueous Solutions, Batch Adsorption, Bentonite, Bromide, Cadmium, Capacity, Carbon, Chromium, Clay, Concentration, Cone Biomass, Cost-Effective, Cr(VI), Cr(VI) Adsorption, Data, Equilibrium, First Order, Freundlich, Heavy-Metals, Hexadecyltrimethylammonium, Information, Ions, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Metal, Models, Modification, Modified, Modified Clay, Montmorillonite, pH, pH-Dependent, Pinus-Sylvestris, Potential, Pseudo Second Order, Pseudo-Second-Order, Regression, Removal, Solution, Solutions, Sorption, Waste-Water, Zinc

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Full Text: [2009\Desalination244, 188.pdf](2009/Desalination244,%20188.pdf)

Abstract: Biosorption of lead(II) ions onto *Phaseolus vulgaris* L. waste was investigated with the variation in the parameters of pH, contact time, biosorbent and lead(II) concentrations and temperatures. The nature of the possible biosorbent and metal ion interactions was examined by the FTIR technique. The lead(II) biosorption equilibrium was attained within 20 min. Biosorption of lead(II) ions onto P. vulgaris L. waste followed by the Langmuir and Dubinin-Radushkevich isotherm models. Maximum biosorption capacity (q(max)) of biosorbent for lead(II) ions was 2.064×10-4 mol g-1 or 42.77 mg g-1 at 20°C. Thermodynamic parameters such as the changes of free energy, enthalpy and entropy were also evaluated for the biosorption of lead(II) ions onto P. vulgaris L. waste. It was indicated that the biosorption of lead(II) ions onto P. vulgaris L. waste is a spontaneous endothermic process.

Keywords: Adsorbent, Adsorption, Aqueous-Solutions, Biomass, Biosorbent, Biosorption, Capacity, Changes, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, FTIR, Heavy-Metal Ions, Ions, Isotherm, Kinetic, Kinetics, Langmuir, Lead(II), Lead(II) Ions, Metal, Models, P, Palm Kernel Fiber, pH, Removal, Sea Nodule, Sorption, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Tree Fern, Waste, Waste Biomass, Water

? Abdullah, A.Z., Salamatinia, B. and Kamaruddin, A.H. (2009), Application of response surface methodology for the optimization of NaOH treatment on oil palm frond towards improvement in the sorption of heavy metals. *Desalination*, **244** (1-3), 227-238.

Full Text: [2009\Desalination244, 227.pdf](2009/Desalination244,%20227.pdf)

Abstract: NaOH treatment on oil palm frond (OPF) to improve its heavy metal sorption was investigated. OPF was treated with between 0.1 and 1.1 M of NaOH for up to 5 h. For the sorption study, 1.0 g of the sorbent was in contact with 250 ml of 100 mg/l Zn and Cu solutions. Response surface methodology (RSM) was employed to optimize the conditions of the base treatment process. The treatment resulted in a marked improvement in the sorption capacity. RSM study resulted in quadratic models demonstrating the weaker effect of treatment time against the dominant effect of the base concentration, indicating the fast rate of the base treatment process. The conditions for the optimized process were achieved by treating the OPF in a 1.0 M NaOH solution for 45 main to give a removal of 61.5% and 64.0% for Zn and Cu, respectively. The results obtained were found to be significant at 99% confidence interval. Compared to Langmuir isotherm, Freundlich isotherm fitted the experimental data better (R-2 > 0.99), indicating the heterogeneity of the binding sites in the NaOH modified OPF. Despite lower strength and energy of the metal-sorbent interactions, a higher number of metal binding sites after NaOH treatment led to an improved sorption process.

Keywords: Adsorbent, Adsorption, Aqueous-Solutions, Binding, Binding Sites, Biomass, Biosorption, Capacity, Concentration, Confidence, Cu, Cu(II), Data, Energy, Experimental, Freundlich, Freundlich Isotherm, Heavy Metal, Heavy Metal Sorption, Heavy Metals, Heterogeneity, Improvement, Interval, Ions, Isotherm, Langmuir, Langmuir Isotherm, Metal, Metal Sorption, Metals, Methodology, Models, Modified, NaOH, NaOH Treatment, Oil Palm Frond, Optimization, Pretreatment, Removal, Response Surface Methodology, RSM, Solution, Solutions, Sorbent, Sorption, Sorption Capacity, Sorption Process, Strength, Surface, Treatment, Zn(II)

? Han, R.P., Wang, Y., Zhao, X., Wang, Y.F., Xie, F.L., Cheng, J.M. and Tang, M.S. (2009), Adsorption of methylene blue by phoenix tree leaf powder in a fixed-bed column: experiments and prediction of breakthrough curves. *Desalination*, **245** (1-3), 284-297.

Full Text: [2009\Desalination245, 284.pdf](2009/Desalination245,%20284.pdf)

Abstract: A continuous adsorption study in a fixed-bed column was carried out by using phoenix tree leaf powder as an adsorbent for the removal of methylene blue (MB) from aqueous solution. The effect of flow rate, influent MB concentration and bed depth on the adsorption characteristics of adsorbent was investigated at pH 7.4. Data confirmed that the breakthrough curves were dependent on flow rate, initial concentration of dye and bed depth. Four kinetic models, Thomas, Adams-Bohart, Yoon-Nelson and Clark, were applied to experimental data to predict the breakthrough curves using nonlinear regression and to determine the characteristic parameters of the column that are useful for process design, while a bed-depth service time analysis (BDST) model was used to express the effect of bed depth on breakthrough curves and to predict the time needed for breakthrough at other conditions. The Thomas and Clark models were found suitable for the description of whole breakthrough curve, while the Adams-Bohart model was only used to predict the initial part of the dynamic process. The data were in good agreement with the BDST model. It was concluded that the leaf powder column can be used in wastewater treatment.

Keywords: Adsorbent, Adsorption, Analysis, Aqueous Solution, Aqueous-Solution, BDST, Bdst Model, Biosorption, Bottom Ash, Breakthrough, Breakthrough Curve, Breakthrough Curves, Characteristics, Column, Concentration, Data, Design, Dye, Dye Removal, Dynamic, Experimental, Experiments, Fixed Bed, Fixed-Bed Bioreactors, Flow, Flow Rate, Granular Activated Carbon, Industry Waste, Kinetic, Kinetic Models, Kinetics, Leaf Powder, MB, Methylene Blue, Model, Modeling, Models, Natural Zeolite, Nonlinear Regression, pH, Prediction, Process Design, Regression, Removal, Rice Husk, Service, Solution, Treatment, Waste-Water, Wastewater, Wastewater Treatment

? Peleka, E.N. and Deliyanni, E.A. (2009), Adsorptive removal of phosphates from aqueous solutions. *Desalination*, **245** (1-3), 357-371.

Full Text: [2009\Desalination245, 357.pdf](2009/Desalination245,%20357.pdf)

Abstract: Phosphates removal from aqueous solutions was investigated using three different inorganic materials: laboratory synthesized goethitc, commercial alumina and commercial hydrotalcite. Equilibrium and kinetic studies were carried out to determine their sorption capacity and the rate of phosphate ions uptake. Equilibrium data were analyzed by Langmuir and Freundlich isotherms. The maximum sorption capacity at 25ºC was found to be 244.58 mg g-1 for calcined hydrotalcite at 500ºC, 192.9 for calcined hydrotalcite at 400ºC, 144 mg g-1 for goethite, 60 mg g-1 for hydrotalcite and 34.57 mg g-1 for aluminumoxid S. Kinetic data followed a pseudo-second-order kinetic model.

Keywords: Adsorption, Akaganeite, Alumina, Aqueous Solutions, Calcined, Calcined Hydrotalcite, Capacity, Data, Equilibrium, Freundlich, Goethite, Hydrotalcite, Inorganic Materials, Ions, Isotherms, Kinetic, Kinetic Model, Kinetic Studies, Kinetic Study, Kinetics, Langmuir, Langmuir and Freundlich Isotherms, Model, Nanocrystals, Phosphate, Phosphates, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Solutions, Sorption, Sorption Capacity, Uptake, Water

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Full Text: [2009\Desalination246, 257.pdf](2009/Desalination246,%20257.pdf)

Abstract: Mono- and pentamine immobilized silica were prepared through the treatment of silica with 3-aminopropyltriethoxysilane and 3-glycidoxypropyltrimethoxysialne. The success of immobilization process was confirmed by means of FT-IR and thermogravimetry (TG). The surface properties of the modified silica obtained were investigated by means of nitrogen surface area (BET), pore volume, zeta potential and amine content. The uptake behaviour of the modified silica towards mercury ions at different experimental conditions of pH, time, concentration and temperature using batch and column methods was studied. The maximum uptake values at 293 K were 1.70 and 3.50 mmol g-1 for MAMS and PAMS, respectively. Kinetics and thermodynamics data showed a pseudo-second order adsorption process with endothermic nature. Regeneration of the modified silica was performed using 0.50 mol dm-3 KI.

Keywords: 3-Aminopropyltriethoxysilane, Adsorption, Adsorption Behavior, Aqueous Solution, Atomic-Absorption-Spectrometry, Batch, Behaviour, BET, Chelating Resins, Column, Concentration, Data, Endothermic, Experimental, FT-IR, FTIR, Gel, Heavy-Metals, Immobilization, Immobilized, Ions, Kinetics, Mercury, Mercury(II), Metal-Ions, Methods, Modified, Modified Silica, Nitrogen, PAM, pH, Pore Volume, Potential, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Regeneration, Removal, Silica, Solid-Phase Extraction, Solution, Surface, Surface Area, Surface Properties, Temperature, Thermodynamics, Thermogravimetry, Treatment, Uptake, Volume, Zeta Potential

? Sonawane, G.H. and Shrivastava, V.S. (2009), Kinetics of decolourization of malachite green from aqueous medium by maize cob (*Zea maize*): An agricultural solid waste. *Desalination*, **247** (1-3), 430-441.

Full Text: [2009\Desalination247, 430.pdf](2009/Desalination247,%20430.pdf)

Abstract: Adsorbent prepared from maize cob powder (MCP), an agricultural waste, was successfully used to remove the malachite green from an aqueous solution. The adsorption was carried out by varying the parameters such as agitation time, dye concentration, adsorbent dose and pH at constant temperature of 27ºC. Kinetic parameters of adsorption such as Lagergren pseudo first-order, pseudo second-order, Elovich and intraparticle diffusion models were determined. Equilibrium adsorption data followed both Langmuir and Freundlich isotherms. The adsorption capacity was found to be 80.64 mg dye/g of adsorbent. These studies suggested that MCP could be used as a low-cost alternative in wastewater treatment for dye removal. The adsorbent was also characterized by FTIR, XRD and SEM analyses.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Adsorption, Adsorption Capacity, Agitation, Agricultural, Agricultural Solid Waste, Agricultural Waste, Alternative, Analyses, Aqueous Medium, Aqueous Solution, Azo Dyes, Biosorption, Capacity, Concentration, Data, Decolorization, Decolourization, Diffusion, Dye, Dye Removal, Effluent, Elovich, Equilibrium, First Order, Freundlich, Ftir, Intraparticle Diffusion, Isotherms, Kinetic, Kinetic Parameters, Kinetics, Langmuir, Langmuir and Freundlich Isotherms, Low Cost, Maize, Maize Cob, Malachite Green, Models, pH, Pseudo First Order, Pseudo First-Order, Pseudo Second Order, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Sawdust, Second Order, Second-Order, SEM, Solid Waste, Solution, Sorption, Temperature, Treatment, Waste, Wastewater, Wastewater Treatment, XRD

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Full Text: [2009\Desalination247, 530.pdf](2009/Desalination247,%20530.pdf)

Abstract: Low chromite containing overburden is usually dumped as a waste material during mining of chromite ore. A large quantity of such waste is generated in TISCO chromite mines, India. Since this overburden material contains 20-46% iron, it can be a potential adsorbent for toxic metal ions present in wastewaters and industrial effluents. A typical sample of overburden from TISCO chromite mines containing 43.75% iron was used for Pb(II) adsorption from aqueous solutions. The specific surface area was estimated to be 50.8 m2/g. The XRD pattern showed the presence of goethite, hematite and silica (quartz) as the major crystalline phases. The experimental parameters varied during adsorption were time, pH, temperature, Pb(II) and sample concentration. The maximum loading capacity was estimated to be 24.28 mg g-1 of sample under the following conditions: initial Pb(II) concentration 250 mg L-1, temperature 35°C, pH 5.23, 2 g L-1 of chromite overburden sample and time 30 min. The adsorption data at pH 5.23 fitted well to Langmuir and Freundlich isotherms. The data at lower pH values of 2 and 4 fitted only to Langmuir model. The thermodynamic parameters ΔGº, ΔHº and ΔSº were determined at various pH values. From the results it was observed that the adsorption at pH of 2 and 4 was endothermic while at pH 5.23, it was independent of temperature. The XRD pattern of Pb(II) overburden sample revealed that relative intensity of (110) plane of goethite and (012) plane of SiO2 decreased during adsorption. The good loading capacity of this material suggests that it can be effectively used for Pb(II) removal from aqueous solutions.

Keywords: Adsorbent, Adsorption, Aqueous Solutions, Aqueous-Solution, Capacity, Chromite Mine Overburden, Concentration, Data, Effluents, Endothermic, Experimental, Freundlich, Freundlich Isotherm, Goethite, Goethite Alpha-FeOOH, Hematite, India, Ions, Iron, Iron-Oxide, Isotherms, Kinetics, Kinetics, L1, Langmuir, Langmuir and Freundlich Isotherms, Langmuir Isotherm, Langmuir Model, Lead, Loading, Metal, Metal Ions, Metal Removal, Methylene-Blue, Mining, Model, Pattern, Pb(II), pH, Potential, Quartz, Removal, Silica, Sludge Ash, Solutions, Sorption, Specific Surface, Specific Surface Area, Surface, Surface Area, Surface-Chemistry, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Toxic, Waste, Wastewaters, XRD

? Hameed, B.H., Ahmad, A.A. and Aziz, N. (2009), Adsorption of reactive dye on palm-oil industry waste: Equilibrium, kinetic and thermodynamic studies. *Desalination*, **247** (1-3), 551-560.

Full Text: [2009\Desalination247, 551.pdf](2009/Desalination247,%20551.pdf)

Abstract: The adsorption of C. I. Reactive Red 120 (RR120) on activated oil palm ash (AOPA) was studied in a batch system. The adsorption studies were carried out at different initial dye concentrations (50-600 mg L-1), Solution pH (2-12) and temperature (30, 40 and 50ºC). The experimental data were analyzed by the Langmuir and Freundlich isotherms. The Freundlich model agreed very well with the experimental data. The maximum monolayer adsorption capacities obtained from the Langmuir model was 200.12, 334.78 and 376.41 mg g-1 at 30, 40 and 50ºC, respectively. The pseudo-first-order and pseudo-second-order were used to describe the kinetics data. The adsorption kinetics of RR120 onto AOPA was described by the pseudo-second-order kinetic equation. The activation energy, change of Gibbs free energy, enthalpy and entropy of adsorption were also evaluated for the adsorption of RR120 onto AOPA.

Keywords: Activated Carbon, Activation, Activation Energy, Adsorption, Adsorption Capacities, Adsorption Isotherm, Adsorption Kinetics, Aqueous-Solution, Ash, Batch, Batch System, Behavior, C.I. Reactive Red 120, Data, Dye, Energy, Enthalpy, Entropy, Equilibrium, Experimental, Freundlich, Freundlich Model, Gibbs Free Energy, Isotherms, Kinetic, Kinetic Equation, Kinetics, L1, Langmuir, Langmuir and Freundlich Isotherms, Langmuir Model, Methylene-Blue, Model, Monolayer, Oil Palm Ash, Palm Ash, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Equation, Reactive Dye, Removal, Solution pH, Sorption, Temperature, Thermodynamic, Thermodynamic Studies, Thermodynamics, Waste, Water

? Ahmad, A., Rafatullah, M., Sulaiman, O., Ibrahim, M.H., Chii, Y.Y. and Siddique, B.M. (2009), Removal of Cu(II) and Pb(II) ions from aqueous solutions by adsorption on sawdust of Meranti wood. *Desalination*, **247** (1-3), 636-646.

Full Text: [2009\Desalination247, 636.pdf](2009/Desalination247,%20636.pdf)

Abstract: Meranti tree sawdust, an inexpensive material, is currently being investigated as an adsorbent for the removal of Cu(II) and Pb(II) ions from aqueous solutions. In this work, adsorption of Cu(II) and Pb(II) ions on Meranti tree sawdust has been studied by using batch techniques. The equilibrium adsorption level was determined to be a function of the solution of pH, contact time, and adsorbent dosage. Adsorption isotherms of Cu(II) and Pb(II) ions on adsorbents were determined and correlated with common isotherm equations such as Langmuir and Freundlich models. The thermodynamic parameters like free energy, enthalpy, and entropy changes for the adsorption of Cu(II) and Pb(II) ions have also been computed and discussed. The heat of adsorption [Delta H = 31.47 kJ/mol for Cu(II) and Delta H = 20.07 kJ/mol for Pb(II)] implied that the adsorption was endothermic in nature.

Keywords: Heavy Metals, Adsorption, Endothermic, Meranti Wood, Sawdust, Heavy-Metal Ions, Activated Carbon, Thermodynamic Parameters, Copper(II) Ions, Equilibrium, Water, Lead(II), Sorption, Waste, Zinc

? Oliveira, F.D., Paula, J.H., Freitas, O.M. and Figueiredo, S.A. (2009), Copper and lead removal by peanut hulls: Equilibrium and kinetic studies. *Desalination*, **248** (1-3), 931-940.

Full Text: [2009\Desalination248, 931.pdf](2009/Desalination248,%20931.pdf)

Abstract: This research work aims to study the use of peanut hulls, an agricultural and food industry waste, for copper and lead removal through equilibrium and kinetic parameters evaluation. Equilibrium batch studies were performed in a batch adsorber. The influence of initial pH was evaluated (3-5) and it was selected between 4.0 and 4.5. The maximum sorption capacities obtained for the Langmuir model were 0.21±0.03 and 0.18±0.02 mmol/g, respectively for copper and lead. In bi-component systems, competitive sorption of copper and lead was verified, the total amount adsorbed being around 0.21 mmol. of metal per gram of material in both mono and bi-component systems. In the kinetic studies equilibrium was reached after 200 min contact time using a 400 rpm stirring rate, achieving 78% and 58% removal, in mono-component system, for copper and lead respectively. Their removal follows a pseudo-second-order kinetics. These studies show that most of the metals removal occurred in the first 20 min of contact, which shows a good uptake rate in all systems.

Keywords: Adsorption, Agricultural, Algae, Aqueous-Solution, Batch, Batch Studies, Capacity, Competitive, Copper, Equilibrium, Evaluation, First, Food, Heavy-Metals, Ions, Kinetic, Kinetic Parameters, Kinetic Studies, Kinetics, Langmuir, Langmuir Model, Lead, Lead Removal, Low-Cost Adsorbents, Metal, Metals, Metals Removal, Model, Nov, Peanut Hulls, pH, Removal, Research, Research Work, Sorption, Systems, Uptake, Waste, Wastewater, Work

? Lu, C.Y., Liu, C.T. and Su, F.S. (2009), Sorption kinetics, thermodynamics and competition of Ni2+ from aqueous solutions onto surface oxidized carbon nanotubes. *Desalination*, **249** (1), 18-23.

Full Text: [2009\Desalination249, 18.pdf](2009/Desalination249,%2018.pdf)

Abstract: Singlewalled carbon nanotubes (SWCNTs) and multiwalled carbon nanotubes (MWCNTs) were oxidized by NaClO solutions and were employed as sorbents to study their sorption kinetics and thermodynamics of Ni2+ from aqueous solutions. The amount of Ni2+ sorbed onto SWCNTs and MWCNTs increased with a rise in temperature. The sorption kinetics follows the pseudo-second-order rate law while the sorption thermodynamics indicates the endothermic and spontaneous nature. Under the same conditions, the SWCNTs and MWCNTs possess better performance of Ni2+ sorption than the commercially available granular activated carbon, reflecting that both CNTs are efficient Ni2+ sorbents in water and wastewater treatment. The competitive sorption of Ni2+ and Zn2+ onto SWCNTs and MWCNTs was also conducted and revealed that the sorption capacities of Ni2+ and Zn2+ Without competition are much greater than those with competition. The competition which Zn2+ exerts on the sorption of Ni2+ is stronger than the competition exerted by Ni2+ on the sorption of Zn2+. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activated Carbons, Adsorption, Aqueous Solutions, Carbon, Carbon Nanotubes, Competition, Competitive, Copper, Endothermic, Equilibrium, Granular Activated Carbon, Kinetics, Kinetics and Thermodynamics, Law, Multiwalled Carbon Nanotubes, Mwcnts, Nanotubes, Ni2+, Nickel, Nickel, Nov, Performance, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Rate Law, Removal, Rights, Solutions, Sorbents, Sorption, Sorption Kinetics, Surface, Temperature, Thermodynamics, Treatment, Wastewater, Wastewater Treatment, Water, Zinc(II), Zn2+

? Tang, X.W., Li, Z.Z., Chen, Y.M. and Wang, Z.Q. (2009), Removal of Zn(II) from aqueous solution with natural Chinese loess: Behaviors and affecting factors. *Desalination*, **249** (1), 49-57.

Full Text: [2009\Desalination249, 49.pdf](2009/Desalination249,%2049.pdf)

Abstract: The Chinese loess was proved a promising adsorbent for Zn(II) removal from aqueous solution with adsorption capacities at 70.2-83.2 mg g-1 at 15-45ºC. Batch tests were conducted to evaluate the factors affecting the removal efficiency, of which the pH, temperature and initial Zn concentration all found in positive relevance to the increase of Zn(II) removal efficiency except for the slurry concentration. The uptake of Zn(II) on Chinese loess was considered as ion-exchange adsorption based on the calculated adsorption energy at -12.8 to -16.18 kJ mol-1 by D-R isothermal adsorption model. The adsorption kinetics follows the pseudo-second-order kinetics and the equilibrating duration was found to be > 24 h. Thermodynamic investigation shows that the enthalpy and entropy changes during adsorption are in the range of 18.27-47.83 kJ mol-1 and 52.7-129.6 J mol-1 K-1. respectively. The predicted Gibb’s free energies were in the range of -5.97-3.09 kJ mol-1, indicating that the adsorption was in favor of higher temperature and lower initial Zn(II) concentration. The optimal Zn(II) removal efficiency could be obtained under the following conditions: low or intermediate Zn(II) concentration, long reaction time, high temperature and initial pH > 3.0. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Capacities, Adsorption Kinetics, Aqueous Solution, Changes, Chinese, Chinese Loess, Concentration, Copper(II), Duration, Efficiency, Energy, Enthalpy, Entropy, Equilibrium, Fly-Ash, Heavy-Metals, Investigation, Ion Exchange, Ion-Exchange, Ionexchange, Isothermal, Isothermal Adsorption, Kinetics, Loess, Mechanisms, Model, Natural, Nov, pH, Precipitation, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Relevance, Removal, Removal Efficiency, Rights, Solution, Temperature, Thermodynamic, Thermodynamics, Uptake, Waste-Water, Wastewater, Zinc Sorption, Zn(II)

? Atar, N. and Olgun, A. (2009), Removal of basic and acid dyes from aqueous solutions by a waste containing boron impurity. *Desalination*, **249** (1), 109-115.

Full Text: [2009\Desalination249, 109.pdf](2009/Desalination249,%20109.pdf)

Abstract: In this study, batch experiments were carried out for the sorption of basic blue 41 (BB 41), and acid blue 225 (AB 225) onto boron waste (BW) from boron enrichment plant. The operating variables studied are the initial dye concentration, contact time, solution pH, and adsorbent dosage. The experimental equilibrium data were analyzed by using various adsorption isotherm models and the results have shown that the adsorption behavior of AB 225 and BB 41 could be described well reasonably by Langmuir and Temkin isotherms, respectively. Kinetics studies indicated that the adsorption of both dyes follow pseudo-second-order kinetics. The sorption of basic dye increased at high pH values, whereas the opposite was true for acidic dye. The results indicate that BW could be employed as low-cost alternatives to the commercially available adsorbents in wastewater treatment for the removal of acid and basic dyes. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid Blue 225, Acid Dyes, Acidic Dye, Adsorbent, Adsorbent Dosage, Adsorbents, Adsorption, Adsorption Behavior, Adsorption Isotherm, Adsorption Isotherm Models, Adsorption-Kinetics, Alternatives, Aqueous Solutions, Basic Blue, Basic Blue 41, Basic Dye, Basic Dyes, Batch, Batch Experiments, Behavior, Boron, Cationic Dye, Concentration, Contact Time, Data, De-Oiled-Soya, Dye, Dyes, Enrichment, Equilibrium, Experimental, Experiments, Fly-Ash, Hazardous Dye, Hen Feathers, Isotherm, Isotherm Models, Isotherms, Kinetics, Langmuir, Low Cost, Malachite Green, Materials-Bottom Ash, Methylene-Blue, Models, Nov, pH, Plant, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, Rhodamine-B, Rights, Solution, Solutions, Sorption, Treatment, Waste, Wastewater, Wastewater Treatment

? Karapinar, N. and Donat, R. (2009), Adsorption behaviour of Cu2+ and Cd2+ onto natural bentonite. *Desalination*, **249** (1), 123-129.

Full Text: [2009\Desalination249, 123.pdf](2009/Desalination249,%20123.pdf)

Abstract: The adsorption behaviour of Cu2+ and Cd2+ onto bentonite was studied as a function of temperature under optimized conditions of amount of adsorbent, particle size. pH, concentration of metals, and shaking time. The adsorption patterns of metal ions onto followed the Langmuir, Freundlich and Dubinin-Radushkevich isotherms. This included adsorption isotherms of single-metal solutions at 298-333 K by batch experiments. The thermodynamic parameters such as variation of enthalpy ΔH, variation of entropy ΔS and variation of Gibbs free energy ΔG were calculated from the slope and intercept of InKo vs. 1/T plots. The adsorptions were endothermic reactions. The results suggested that natural bentonite was suitable as sorbent material for the recovery and adsorption of metal ions from aqueous solutions. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Isotherms, Aqueous Solutions, Aqueous-Solutions, Batch, Batch Experiments, Behaviour, Bentonite, Cadmium, Cd2+, Concentration, Cu2+, Endothermic, Energy, Enthalpy, Entropy, Expanded Perlite, Experiments, Freundlich, Function, Gibbs Free Energy, Heavy Metals, Heavy-Metal, Ions, Isotherms, Kaolinite, Langmuir, Metal, Metal Ions, Metals, Montmorillonite, Montmorillonite, Natural, Natural Bentonite, Nov, Particle Size, Pb(II), pH, Recovery, Removal, Rights, Size, Solutions, Sorbent, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Water

? Wang, X.S. and Li, Z.Z. (2009), Removal of Cr(VI) from aqueous solution by newspapers. *Desalination*, **249** (1), 175-181.

Full Text: [2009\Desalination249, 175.pdf](2009/Desalination249,%20175.pdf)

Abstract: The potential to remove Cr(VI) ions from aqueous solution using newspapers was investigated in the present study. The effects of relevant parameters such as solution pH, adsorbent concentration, and reaction temperature on Cr(VI) adsorption were examined. The adsorption of Cr(VI) ions onto newspapers was found to be highly pH-dependent and the highest uptake occurred at pH 1.0. The sorption equilibrium data were correlated to the Langmuir, Freundlich, Redlich-Peterson and Dubinin-Radushkevich equations. Five different non-linear error functions were examined and the result indicated that the Freundlich and Redlich-Peterson equations better fitted the equilibrium data than Langmuir isotherm. The maximum sorption capacity was found to be 55.06 mg/g at pH 1.0, adsorbent concentration 4 g/L and reaction temperature of 30°C. Different thermodynamic parameters viz., changes in standard free energy (ΔG), enthalpy (ΔH) and entropy (ΔS) were also evaluated and the results show that the sorption process was spontaneous and endothermic in nature. The kinetic experimental data were well fitted by the pseudo-second order, external film diffusion and diffusion models allowing the corresponding parameters to be evaluated. The sorption capacity increased with the decrease of adsorbent concentration. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous Solution, Capacity, Changes, Concentration, Cr(VI) Removal, Cr(VI), Data, Diffusion, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Error, Error Analysis, Experimental, Film Diffusion, Freundlich, Functions, Heavy-Metals, Ions, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Low Cost Adsorbent, Models, Newspapers, Nov, pH, pH-Dependent, Potential, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Redlich-Peterson, Removal, Rights, Solution, Sorption, Sorption Capacity, Sorption Process, Spontaneous, Standard, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Uptake, VI

? Tekbaş, M., Bektaş, N. and Yatmaz, H.C. (2009), Adsorption studies of aqueous basic dye solutions using sepiolite. *Desalination*, **249** (1), 205-211.

Full Text: [2009\Desalination249, 205.pdf](2009/Desalination249,%20205.pdf)

Abstract: Sepiolite, low cost, locally available and natural mineral was studied as an adsorbent for the removal of Basic Astrazon yellow 7GL from aqueous solutions and batch contact tests. The kinetics of the adsorption process was tested for the pseudo-first order, pseudo-second order reaction and intra-particle diffusion models. The rate constants of adsorption for all these kinetic models were calculated. Good correlation coefficients were obtained for the pseudo-second order kinetic model. Langmuir, Freundlich and Dubinin-Radushkevich isotherm models were applied to the experimental equilibrium data by changing temperature. The isotherm constants were determined by using the linear regression of these models. The monolayer coverage capacities of sepiolite for basic dye were found to be in the range of 62.5-88.5 mg/g at different temperatures. Thermodynamic studies showed that the reaction for dye uptake by sepiolite is endothermic in nature. Based on the optimum parameters sepiolite was also used as adsorbent for raw wastewater treatment and found as efficient as dye color removal. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Anionic Dyes, Aqueous Solutions, Basic Dye, Batch, Color Removal, Correlation, Cost, Coverage, Data, Diffusion, Dye, Endothermic, Equilibrium, Experimental, Freundlich, Intra Particle Diffusion, Intra-Particle Diffusion, Intraparticle Diffusion, Ions, Isotherm, Isotherm Models, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Lead, Linear Regression, Low Cost, Model, Models, Monolayer, Natural, Nov, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Constants, Raw Wastewater, Reactive Dyes, Regression, Removal, Rights, Sepiolite, Solutions, Sorption, Temperature, Thermodynamic, Thermodynamic Studies, Treatment, Uptake, Wastewater, Wastewater Treatment

? Sarı, A. and Tuzen, M. (2009), Kinetic and equilibrium studies of Pb(II) and Cd(II) removal from aqueous solution onto colemanite ore waste. *Desalination*, **249** (1), 260-266.

Full Text: [2009\Desalination249, 260.pdf](2009/Desalination249,%20260.pdf)

Abstract: The adsorption characteristics of Pb(II) and Cd(II) onto colemanite ore waste (CW) from aqueous solution were investigated as a function of pH, adsorbent dosage, contact time, and temperature. Langmuir, Freundlich and Dubinin-Radushkevich (D-R) models were applied to describe the adsorption isotherms. Langmuir model fitted the equilibrium data better than the Freundlich isotherm. The adsorption capacity of CW was found to be 33.6 mg/g and 29.7 mg/g for Pb(II) and Cd(II) ions, respectively, Analyte ions were desorbed from CW using both 1 M HCl and 1 M HNO3. The recovery for both metal ions was found to be higher than 95%. The mean adsorption energies evaluated using the D-R model indicated that the adsorption of Pb(II) and Cd(II) onto CW were taken place by chemisorption. The thermodynamic parameters (ΔG°, ΔH° and ΔS°) showed that the adsorption of both metal ions was feasible, spontaneous and exothermic at 20-50ºC. Adsorption mechanisms were also investigated using the pseudo-first-order and pseudo-second-order kinetic models. The kinetic results showed that the adsorption of Pb(II) and Cd(II) onto CW followed well pseudo-second order kinetics. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacity, Adsorption Characteristics, Adsorption Isotherms, Aqueous Solution, Biosorption, Bottom Ash, Brewery Biomass, Cadmium Ions, Capacity, Cd(II), Cd(II) Ions, Cd(II) Removal, Characteristics, Chemisorption, Colemanite Ore Waste (CW), Contact Time, Data, Equilibrium, Equilibrium Studies, Exothermic, Fly-Ash, Freundlich, Freundlich Isotherm, Function, Hazelnut Shell, Heavy-Metals, Ions, Isotherm, Isotherms, Kaolinite Clay, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Model, Mechanisms, Metal, Metal Ions, Model, Models, Nov, Pb(II), pH, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Recovery, Removal, Rights, *Saccharomyces cerevisiae*, Solution, Spontaneous, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste

? Franca, A.S., Oliveira, L.S. and Ferreira, M.E. (2009), Kinetics and equilibrium studies of Methylene blue adsorption by spent coffee grounds. *Desalination*, **249** (1), 267-272.

Full Text: [2009\Desalination249, 267.pdf](2009/Desalination249,%20267.pdf)

Abstract: Spent coffee grounds (SCG), a residue from the soluble coffee industry was evaluated as an adsorbent for the removal of methylene blue (MB) from aqueous solution. Batch adsorption tests were performed at 25 degrees C and the effects of contact time, adsorbent dosage, and pH were investigated. Adsorption kinetics was determined by fitting first and second-order kinetic models to the experimental data, with the second-order model providing the best description of MB adsorption onto spent coffee grounds. The typical dependence of dye uptake on kinetic studies indicated the adsorption process to be both chemisorption and diffusion controlled. The experimental adsorption equilibrium data were fitted to Langmuir, Freundlich and Tempkin adsorption models. The experimental data obtained in the present study indicate that spent coffee grounds are suitable candidates for use as adsorbents in the removal of cationic dyes. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorbents, Adsorption, Adsorption Equilibrium, Adsorption Kinetics, Agri-Food Waste, Aqueous Solution, Aqueous-Solutions, Batch Adsorption, Biosorption, Cationic Dyes, Chemisorption, Data, Diffusion, Dye, Dyes, Equilibrium, Equilibrium Studies, Experimental, First, Freundlich, Interfaces, Kinetic, Kinetic Models, Kinetic Studies, Kinetics, Langmuir, MB, Methylene Blue, Methylene Blue Adsorption, Model, Models, Nov, pH, Removal, Rights, Second Order, Second-Order, Second-Order Model, Solute Adsorption, Solution, Sorption, Theoretical Description, Uptake

? Kiran, I., Ilhan, S., Caner, N., Iscen, C.F. and Yildiz, Z. (2009), Biosorption properties of dried *Neurospora crassa* for the removal of Burazol Blue ED dye. *Desalination*, **249** (1), 273-278.

Full Text: [2009\Desalination249, 273.pdf](2009/Desalination249,%20273.pdf)

Abstract: Biosorption potential of dried Neurospora crassa for Burazol Blue ED was studied with respect to pH, equilibrium time, biomass concentration and temperature to determine equilibrium and kinetic model parameters. The most suitable pH, equilibrium time and biomass concentration were determined as 1±0.2. 60 min and 1.6 g L-1, respectively, at 20°C±1.0. The equilibrium data was best described by the Langmuir isotherm model. The maximum biosorption capacity (*q*m) of biomass obtained from the Langmuir fit was 110.1 mg g-1 biomass at 30ºC. The overall biosorption process was best described by the pseudo-second-order kinetic model. The biosorption process was found to be favored at higher temperatures. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated-Sludge, Adsorption, Aqueous-Solution, Biomass, Biosorption, Burazol Blue Ed, Capacity, Concentration, Data, Decolorization, Dye, Effluents, Equilibrium, Gibbs Free Energy, Hydroxylation, Isotherm, Isotherm Model, Isotherms, Kinetic, Kinetic Model, Kinetics, Kinetics, L1, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Methylene-Blue, Model, *Neurospora crassa*, Nov, *Penicillium restrictum*, pH, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Temperature

? Wajima, T., Umeta, Y., Narita, S. and Sugawara, K. (2009), Adsorption behavior of fluoride ions using a titanium hydroxide-derived adsorbent. *Desalination*, **249** (1), 323-330.

Full Text: [2009\Desalination249, 323.pdf](2009/Desalination249,%20323.pdf)

Abstract: The removal behavior of fluoride ions was examined in aqueous sodium fluoride solutions using a titanium hydroxide-derived adsorbent. The adsorbent was prepared from titanium oxysulfate (TiOSO4 center dot xH2O) solution, and was characterized by X-ray diffraction, scanning electron microscopy, thermogravimetry-differential thermal analysis, Fourier transform infrared spectrum and specific surface area. Batchwise adsorption test of prepared adsorbent was carried out in aqueous sodium fluoride solutions and real wastewater containing fluoride ion. The absorbent was the amorphous material, which had different morphology to the raw material, titanium oxysulfate, and the specific surface area of the adsorbent (96.8 m2/g) was 200 times higher than that of raw material (0.5 m2/g). Adsorption of fluoride on the adsorbent was saturated within 30 min in the solution with 200 mg/L of fluoride ions, together with increasing pH of the solution, due to ion exchange between fluoride ions in the solution and hydroxide ions in the adsorbent. Fluoride ions were adsorbed even in at a low fluoride concentration of 5 mg/L; and were selectively adsorbed in the solution containing a high concentration of chloride, nitrate and sulfate ions. The adsorbent can remove fluoride below permitted level (< 0.8 mg/L) from real wastewaters containing various substances. The maximum adsorption of fluoride on the adsorbent could be obtained in the solution at about pH 3. After fluoride adsorption, fluoride ions were easily desorbed using a high pH solution. completely regenerating for further removal process at acidic pH. The capacity for fluoride ion adsorption was almost unchanged three times after repeat adsorption and desorption. The equilibrium adsorption capacity of the adsorbent used for fluoride ion at pH 3 was measured, extrapolated using Langmuir and Freundlich isotherm models, and experimental data are found to fit Freundlich than Langmuir. The prepared adsorbent is expected to be a new inorganic ion exchanger for the removal and recovery of fluoride ions from wastewater. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Absorbent, Activated Alumina, Adsorbent, Adsorption, Adsorption Capacity, Analysis, Aqueous-Solution, Behavior, Cadmium Removal, Capacity, Chloride, Concentration, Cycle Stability, Data, Desorption, Dioxide, Drinking-Water, Electron Microscopy, Equilibrium, Experimental, Fluoride, Fluoride Adsorption, Fluoride Ion, Fluoride Recovery, Fluoride Removal, Freundlich, Freundlich Isotherm, Hydroxide, Ion Exchange, Ion-Exchange, Ions, Isotherm, Isotherm Models, Kinetic-Models, Langmuir, Metal-Ions, Models, Morphology, Nitrate, NOV, pH, Recovery, Removal, Rights, Scanning Electron Microscopy, Selective Adsorption, Sodium, Solution, Solutions, Sorption, Specific Surface, Specific Surface Area, Sulfate, Surface, Surface Area, Thermal Analysis, Titanium, Titanium Hydroxide-Derived Adsorbent, Waste-Water, Wastewater, Wastewaters, X-Ray, X-Ray Diffraction

? Zhao, M.F. and Liu, P. (2009), Adsorption of methylene blue from aqueous solutions by modified expanded graphite powder. *Desalination*, **249** (1), 331-336.

Full Text: [2009\Desalination249, 331.pdf](2009/Desalination249,%20331.pdf)

Abstract: The modified expanded graphite (MEG) powder was used as a porous adsorbent for the removal of the cationic dye. methylene blue (MB), from aqueous solutions. The dye adsorption experiments were carried out with the bath procedure. Experimental results showed that the basic pH, increasing initial dye concentration and high temperature favored the adsorption. The dye adsorption equilibrium was attained rapidly after 5 min of contact time. Experimental data related to the adsorption of MB on the MEG under different conditions were applied to the pseudo-first-order equation, the pseudo-second-order equation and the intraparticle diffusion equation. and the rate constants of first-order adsorption (k1), the rate constants of second-order adsorption (k2) and intraparticle diffusion rate constants (kint) were calculated, respectively. The experimental data fitted very well in the pseudo-second-order kinetic model. The thermodynamic parameters of activation such as Gibbs free energy, enthalpy, and entropy were also evaluated. The results indicated that the MEG powder could be employed as an efficient adsorbent for the removal of textile dyes from effluents. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activation, Adsorbent, Adsorption, Adsorption Equilibrium, Aqueous Solutions, Cationic Dye, Concentration, Contact Time, Data, Diffusion, Dye, Dye Adsorption, Dyes, Effluents, Energy, Enthalpy, Entropy, Equilibrium, Exfoliated Graphite, Experimental, Experiments, First Order, Gibbs Free Energy, Graphite, Intraparticle Diffusion, Isotherm, Kinetic, Kinetic Model, Kinetics, Kinetics, Mb, Methylene Blue, Model, Modeling, Modified, Modified Expanded Graphite, Natural Graphite, Nov, Oxide, Perlite, pH, Procedure, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-First-Order Equation, Pseudo-Second-Order, Pseudo-Second-Order Equation, Pseudo-Second-Order Kinetic Model, Rate Constants, Removal, Rights, Second Order, Second-Order, Solutions, Temperature, Thermodynamic, Thermodynamic Parameters

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Full Text: [2009\Desalination249, 343.pdf](2009/Desalination249,%20343.pdf)

Abstract: Typha domingensis phytomass was used as a biosorbent for metal ions removal from wastewater A full 2(3). factorial design of experiments was used to obtain the best conditions of biosorption of Fe3+ and Zn2+ from water solutions. The three factors considered were temperature, pH, and biosorbent dosage. Two levels for each factor were used; pH (2.5 and 6.0), temperature (25 and 45 degrees C), and phytomass loading weight (0.5 and 1 g/50 ml). Batch experiments were carried out using 50 ml solutions containing 10 mg/l Fe3+ and 4 mg/l Zn2+ simulating the concentration of those metals in a real wastewater effluent. The removal percentages of iron and zinc after 120 min of contact time were then evaluated. The results were analyzed statistically using the Minitab 15 statistical software to determine the most important factors affecting the metals removal efficiency. The pH was found to be the most significant factor for the two studied metal ions. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Biomass, Biosorbent, Biosorption, Chromium(VI), Concentration, Copper(II), Cr(VI), Design, Efficiency, Experimental, Experimental Design, Experiments, Factorial Design, Heavy-Metals, Industrial Wastewater, Ions, Iron, Loading, Metal, Metal Ions, Metal Ions Removal, Metals, Metals Removal, NOV, pH, Removal, Removal Efficiency, Rights, Software, Solutions, Temperature, Typha, Typha Domingensis, Waste-Water, Wastewater, Water, Zinc, Zn2+

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Full Text: [2009\Desalination249, 388.pdf](2009/Desalination249,%20388.pdf)

Abstract: Adsorbents prepared from waste plants for the treatment of dyeing effluents have high significance in environmental sustainability. In this research, an attempt is made to analyze the applicability of activated carbon prepared from Euphorbia antiquorum L wood by H3PO4 activation method for the removal of Acid Blue 92 dye. Various kinetic models were used for the analysis of adsorption kinetics and pseudo second-order model fits well for the selected adsorbent-adsorbate system. The moderate rate of dye uptake indicates that the rate-determining step could be physisorption in nature. Langmuir, Freundlich and Dubinin-Raduskevich isotherm models were applied for the analysis of isotherm data. The positive enthalpy of adsorption substantiates that the adsorption process is endothermic in nature. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid Blue 92, Activated Carbon, Activation, Adsorbent, Adsorbents, Adsorption, Adsorption Kinetics, Analysis, Aqueous-Solutions, Biosorption, Carbon, Data, Dye, Effluents, Endothermic, Enthalpy, Enthalpy of Adsorption, Environmental, Euphorbia Antiquorum L, Freundlich, Isotherm, Isotherm Models, Kinetic, Kinetic Models, Kinetics, Langmuir, Low Cost, Methylene-Blue, Model, Models, NOV, Plants, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Rate-Determining Step, Removal, Research, Rice Husk, Rights, Second Order, Second-Order, Second-Order Model, Significance, Sorption, Surface Area, Sustainability, Temperature, Treatment, Uptake, Waste, Wood

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Full Text: [2009\Desalination249, 609.pdf](2009/Desalination249,%20609.pdf)

Abstract: Swine bone char is the combustion residues of swine bone. Cobalt adsorption to swine bone char was studied. Batch kinetics studies showed that a rapid uptake occurred during the first 5 min and was followed with a very slow intraparticle diffusion process. The sorption kinetics was ideally conformed to pseudo-second equation, indicating several mechanisms involved in the adsorption process. Equilibrium sorption isotherm studies showed that the Freundlich isotherm model satisfactorily described the sorption data. The presence of co-ions had appreciable inhibiting effects on cobalt uptake by bone char because copper and zinc had higher affinity for the bone char surface than cobalt. Calcium concentration in solution and XRD analysis showed that ion exchange was involved in the removal of Co from solution over a certain initial cobalt concentration range. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Analysis, Aqueous-Solutions, Bone, Bone Char, Calcium, Cd-2+, Char, Co, Cobalt, Combustion, Competitive, Concentration, Copper, Data, Diffusion, Equilibrium, First, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Hydroxyapatite, Intraparticle Diffusion, Ion Exchange, Ion-Exchange, Ions, Isotherm, Isotherm Model, Kinetics, Mechanism, Mechanisms, Model, Removal, Rights, Solution, Sorption, Sorption Isotherm, Sorption Kinetics, Surface, Swine, Uptake, Water, XRD, Zinc

? García-Soto, M.M.D. and Camacho, E.M. (2009), Boron removal by means of adsorption processes with magnesium oxide - Modelization and mechanism. *Desalination*, **249** (2), 626-634.

Full Text: [2009\Desalination249, 626.pdf](2009/Desalination249,%20626.pdf)

Abstract: The boron adsorption process. in borate ion form, onto magnesium oxide was described in terms of mathematical equations and, taking into account the knowledge acquired by means of experimental data, the most probable mechanism of boron removal process was proposed. The modelization has been carried out by establishing Langmuir adsorption isotherms and kinetic law. Upward convex curves are observed indicating that the process is advantageous towards boron adsorption. Moreover, the adjustment of experimental data to their corresponding functions leads to highly satisfactory correlations for all the studied conditions and pseudo-second-order kinetic model was observed. As for the mechanism of the adsorption process, a superficial process of chemosorption comprising three stages or reactions is proposed: 1) the hydration reaction of magnesium oxide as it is in contact with the aqueous solution to yield a magnesium hydroxide gel over the surface of which the active points for adsorption are located. 2) the alkalisation reaction of the solution due to the acid-base reaction between magnesium oxide and water and 3) the stereospecific chemical reaction between borate ions and active centres. This mechanism develops with time to reach stabilisation and leads to the formation of an adsorption monomolecular layer that is typical in chemosorption processes, as well as in systems following Langmuir adsorption isotherms and pseudo-second-order kinetics. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adjustment, Adsorption, Adsorption Isotherms, Aqueous Solution, Boron, Boron Removal, Brucite, Chemical, Chemosorption, Correlations, Data, Desorption, Experimental, Functions, Gel, Hydration, Hydroxide, Industrial Waste, Ions, Isotherms, Kaolinite, Kinetic, Kinetic Model, Kinetics, Knowledge, Langmuir, Langmuir Isotherm, Law, Magnesium, Mechanism, Model, Modelization, Oxide, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Pseudo-Second-Order Kinetics, Removal, Rights, Solution, Stabilisation, Surface, Systems, Water

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Full Text: [2009\Desalination249, 729.pdf](2009/Desalination249,%20729.pdf)

Abstract: This paper describes the results from an experimental study of the purification of LiHCO3 solution which is used to produce high-purity Li2CO3 by ion exchange. Generally. there are some amounts of Ca2+ and Mg2+ in the LiHCO3 solution whose contents exceed the requirements to produce qualified high-purity Li2CO3, so they need to be removed from the solution. There are many methods available to remove divalent metal ions from solutions, among which the ion exchange is the most simple and efficient one. Investigations of the performance of the chelating resin Amberlite IRC747 for its adsorption for Ca2+ and Mg2+ in LiHCO3 solutions were conducted. Batch studies showed that the SDM-A model could describe the adsorption isotherm data well, and the Karman particle diffusion model could describe the exchange kinetics properly. The study for column operation showed that breakthrough points of Ca2+ and Mg2+ both advanced with increasing the feed flow rate, and the penetration function model could describe the effluent curves adequately. HCl and LiOH of 1 mol . L-1 respectively were used to regenerate resins with good effect. This study will provide the basic reference for process operation and the reactor design to purify the LiHCO3 solution by ion exchange. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Batch Studies, Batch Study, Breakthrough, Calcium, Chelating Resin, Column, Column Operation, Data, Design, Diffusion, Diffusion Model, Divalent Metal Ions, Experimental, Feed, Flow, Flow Rate, Function, Ion Exchange, Ion Exchange Resin, Ion-Exchange, Ion-Exchange Resin, Ionexchange, Ions, Isotherm, Kinetics, L1, LiHCO3 Solution, Magnesium, Metal, Metal Ions, Methods, Model, Operation, Particle Diffusion, Particle Diffusion Model, Performance, Preparation, Purification, Reference, Removal, Resin, Resins, Rights, Solution, Solutions

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Full Text: [2009\Desalination249, 742.pdf](2009/Desalination249,%20742.pdf)

Abstract: The synthetic microporous titanosilicate material ETS-4 has been used for the removal of Hg2+ and Cd2+ from water. Batch stirred experiments were carried out to study the equilibrium and the kinetics of the removal of Hg2+ and Cd2+ from water. It has been demonstrated that ETS-4 has a great affinity for both these metal cations even when their initial concentrations are low. The uptake rates for both Hg2+ and Cd2+ were well described by the pseudo-second order model which constants confirmed that the kinetics of the removal of Cd2+ is faster than that of Hg2+. However, at the equilibrium, ETS-4 has a higher capacity to remove Hg2+ than Cd2+. Adsorption isotherms for both Hg2+ and Cd2+ were well fitted to Langmuir isotherm and the corresponding monolayer capacities of ETS-4 are 0.43 and 0.24 mu mol mg(-1), respectively, which are quite consistent with those predicted by the pseudo-second order kinetic equation. Hence, the contribution of this work is to support the use of this material for the removal of Hg2+ and Cd2+ from water. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Adsorption, Adsorption Isotherms, Aqueous-Solution, Cadmium, Cadmium, Capacity, Cd2+, Copper Ions, Equilibrium, Experiments, Heavy-Metals Uptake, Ions Removal, Isotherm, Isotherms, Kinetic, Kinetic Equation, Kinetics, Langmuir, Langmuir Isotherm, Mercury, Mercury(II), Metal, Model, Monolayer, Pollutants, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Purification, Rates, Removal, Rights, Sorption, Sorption, Support, Titanosilicate, Uptake, Waste-Water, Water, Work

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Full Text: [2009\Desalination249, 757.pdf](2009/Desalination249,%20757.pdf)

Abstract: In the present study a low-cost waste biomass derived from canned food plant, was tested for its ability to remove reactive textile dye from aqueous solutions. The batch biosorption experiments were carried out at various pH, biosorbent dosage. contact time and temperature. Optimum decolorization was observed at pH 2.0 and 1.6 g dm-3 of biomass dosage within 20 min. The first-order and the pseudo-second-order kinetics were investigated for the biosorption system. The applicability of the Langmuir and Freundlich isotherm models was examined. The thermodynamic parameters for the biosorption were also calculated. The experimental results in this study indicated that this low-cost biomaterial was an attractive candidate for the removal of textile dye Reactive Red 198 (RR198) from aqueous solutions. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid-Red-57, Adsorption, Agro-Waste, Agrowaste, Aqueous Solutions, Basic Dye, Batch, Biomass, Biosorbent, Biosorption, Contact Time, Decolorization, Dye, Equilibrium, Experimental, Experiments, First Order, Food, Freundlich, Freundlich Isotherm, Isotherm, Isotherm Models, Kinetics, Kinetics, Langmuir, Low Cost, Methylene-Blue, Models, Parameters, pH, Plant, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Reactive Dye, Removal, Rights, Solutions, Temperature, Textile Dye, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste, Waste Biomass

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Full Text: [2009\Desalination249, 781.pdf](2009/Desalination249,%20781.pdf)

Abstract: This study compares aqueous copper(II) adsorbed onto as-grown and modified carbon nanotubes (CNTs), using H2SO4 and H2SO4/KMnO4 processes. H2SO4 and H2SO4/KMnO4 modifications reduced pH(iep) and Fourier Transform Infrared Spectroscopy (FTIR) analysis revealed that some functional groups were formed on modified CNTs. The adsorption capacity of copper(II) onto modified CNTs was greater than that of as-grown CNTs, especially at pH 6. The results demonstrate that the modified processes increased the adsorption capacity because the functional groups were generated on the modified surfaces of the CNTs. Additionally, the adsorption capacity of copper(II) onto as-grown and modified CNTs both increased with temperature, and the results indicated that the Langmuir isotherm fitted the experimental data well. Simulation results indicated that the ΔH° values of as-grown, H2SO4-modified CNTs and H2SO4/KMnO4-modified CNTs were 4.83, 14.37 and 29.92 kJ/mol, respectively. Based on ΔH°, the adsorption of Cu2+ onto H2SO4/KMnO4-modified CNTs is suggested to proceed simultaneously by physisorption and chemisorption but that onto as-grown and H2SO4-modified CNTs may proceed only by physisorption. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Oxidant, Carbon Nanotubes, Adsorption, Langmuir Isotherm, Copper (II), Adsorption Characteristics, Thermodynamic Parameters, Competitive Adsorption, Cu(II) Adsorption, Lead(II) Ions, Equilibrium, Biosorption, Trihalomethanes, Cadmium(II), Manganese

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Full Text: [2009\Desalination249, 792.pdf](2009/Desalination249,%20792.pdf)

Abstract: This study evaluates the aqueous cadmium(II) adsorption efficiency of as-grown carbon nanotubes (CNTs) and of those modified by microwave (MW)/ H2SO4 and MW/H2SO4/KMnO4 processes. The surface area, pH(iep), and FTIR spectra of CNTs were, before and after modification. compared. Aromatic groups, carbonyl groups and hydroxyl groups were herein detected on the surfaces of MW/ H2SO4 and MW/H2SO4/KMnO4-modified CNTs. At a particular pH, the adsorption capacity of Cd2+ of the MW/H2SO4/KMnO4-modified CNTs exceeded that of MW/ H2SO4-modified CNTs and as-grown CNTs. The kinetic analyses of adsorption were performed and a pseudo second-order model accurately captured the adsorption kinetics. This study suggests that MW/H2SO4 and MW/ H2SO4/KMnO4 modification not only increased the area of active adsorption sites of CNTs but also reduced the modification period by microwave heating. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Adsorption Kinetics, Analyses, Apricot Stone, Cadmium, Cadmium Ion(II), Capacity, Carbon, Carbon Nanotubes, Catalyst, Cd2+, Efficiency, FTIR, FTIR Spectra, Functionalization, Ions, Kinetic, Kinetics, Lead, Metal, Microwave, Model, Modification, Modified, Multiwalled Carbon Nanotubes, Nanotubes, pH, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Removal, Rights, Second Order, Second-Order, Second-Order Model, Surface, Surface Area, Surfaces, Treatment, Water

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Full Text: [2009\Desalination249, 797.pdf](2009/Desalination249,%20797.pdf)

Abstract: CaCl2 modified bentonite (BCa2+), a clean and cost-effective adsorbent with a basal spacing of 15.43 Å, was prepared for the removal of Congo red dye from water. It was effective for the removal of Congo red with a high adsorption capacity, and the adsorption was favored over a broad pH range (5-10). The pseudo-second-order kinetic model provided the best correlation of the experimental data. Adsorption isotherms indicated that sorption took place at specific homogeneous sites within the adsorbent. Furthermore, BCa2+ showed higher sorption capacity compared with other common materials used as adsorbents for Congo red dye. The results showed that BCa2+ could be employed as a low-cost material for the removal of Congo red from aqueous solutions. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Capacity, Adsorption Isotherms, Aqueous Solutions, Bentonite, CaCl2, Capacity, Clays, Congo Red, Congo Red Dye, Correlation, Cost-Effective, Data, Dye, Experimental, Fly-Ash, Isotherms, Kinetic, Kinetic Model, Kinetics, Kinetics, Low Cost, Low-Cost Material, Mechanism, Model, Modified, Modified Bentonite, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Solutions, Sorption, Sorption Capacity, Waste-Water, Water

? Vázquez, G., Freire, M.D., González-Alvarez, J. and Antorrena, G. (2009), Equilibrium and kinetic modelling of the adsorption of Cd2+ ions onto chestnut shell. *Desalination*, **249** (2), 855-860.

Full Text: [2009\Desalination249, 855.pdf](2009/Desalination249,%20855.pdf)

Abstract: A study on the removal of Cd2+ ions from aqueous solutions by acid formaldehyde pretreated chestnut (Castanea sativa) shell was conducted in batch conditions. The influence of different parameters: adsorption time, temperature (15, 25 and 35ºC) and initial concentration of Cd2+ ions (15.3, 50.5 and 87.3 mg L-1), on cadmium uptake was analysed. Cadmium free and cadmium loaded chestnut shell were characterized by FTIR spectroscopy, which evidenced the functional groups involved in cadmium uptake. Cadmium adsorption equilibrium could be described by the Freundlich adsorption model at all the temperatures essayed, which predicted shell heterogeneity. The Cd2+ adsorption process by chestnut shell followed the pseudo second order kinetic model. Cadmium sorption capacity increased with decreasing temperature at an initial concentration of 15.3 mg L-1 and with increasing initial cadmium concentration at a temperature of 25ºC. The second order kinetic constant, which increased with increasing temperature, was used to calculate the energy of adsorption as equal to 19.2 kJ mol-1. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Equilibrium, Aqueous Solutions, Aqueous-Solutions, Batch, Cadmium, Cadmium Adsorption, Capacity, Cd2+, Chestnut Shell, Concentration, Copper, Energy, Equilibrium, Formaldehyde, Freundlich, FTIR, FTIR Spectroscopy, Functional Groups, Heavy-Metal Ions, Heterogeneity, Ions, Kinetic, Kinetic Model, Kinetic Modelling, Kinetics, L1, Model, Modelling, Nickel, Peat, Pinus Pinaster Bark, Pseudo Second Order, Pseudo-Second-Order, Removal, Rights, Second Order, Second-Order, Solutions, Sorption, Sorption Capacity, Spectroscopy, Temperature, Thermodynamic Parameters, Uptake, Wastes

? Subramanyam, B. and Das, A. (2009), Study of the adsorption of phenol by two soils based on kinetic and isotherm modeling analyses. *Desalination*, **249** (3), 914-921.

Full Text: [2009\Desalination249, 914.pdf](2009/Desalination249,%20914.pdf)

Abstract: Various natural adsorbents, which have been in used for removal of pollutants, in general, and phenol, in particular, are mostly directed towards improving the adsorption capacity of the adsorbents by various pretreatments (chemical, thermal or biological), which necessarily lead to increase in the cost as well as in the level of difficulties in regeneration/disposal of the adsorbent. The present studies, on the other hand, are aimed towards evaluating the feasibility of using two common soils as potential low-cost adsorbents for the removal of phenol from its aqueous solution, in their natural forms (i.e., without any pretreatment). Accordingly, experiments were carried out (in batch mode) for optimization of the adsorption parameters (such as pH, contact time. equilibrium time and adsorbent dosage), for varying initial phenol concentrations. The results showed that the maximum phenol adsorption capacity was found at pH similar to 6, under a constant temperature of 30±2ºC (at 6-hour equilibrium period). Several kinetic models (viz. Lagergren first-order, pseudo-second-order, Elovich and intra-particle diffusion) as well as isotherm models (Langmuir, Freundlich, Redlich and Peterson and Sip) were applied to the experimental data. The pseudo-second-order model was found to be the most suitable model describing the adsorption of phenol by two soils (which indicated this adsorption as a chemisorption process). On analysis of equilibrium isotherms for the adsorption of phenol by two soils. Redlich-Peterson and Sip isotherms were found to be the best representative for phenol-sorption on two selected, soil adsorbents. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorbents, Adsorption, Adsorption Capacity, Agricultural Waste, Analyses, Analysis, Aqueous Solution, Aqueous-Solutions, Batch, Batch Mode, Bentonite, Biological, Capacity, Chemical, Chemisorption, Contact Time, Cost, Data, Diffusion, Elovich, Equilibrium, Equilibrium Isotherms, Experimental, Experiments, Feasibility, First Order, Fly-Ash, Forms, Freundlich, General, Intra Particle Diffusion, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherm, Isotherm Modeling, Isotherm Models, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Lead, Low Cost, Low Cost Adsorbents, Low-Cost Adsorbents, Mode, Model, Modeling, Models, Natural, Natural Adsorbents, Optimization, Peat, pH, Phenol, Phenol Removal, Pollutants, Potential, Pretreatment, Pretreatments, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Redlich-Peterson, Removal, Rights, Seed Coat, Soil, Soils, Solution, Sorption, Temperature, Water

? Kuo, C.Y. (2009), Comparison with as-grown and microwave modified carbon nanotubes to removal aqueous bisphenol A. *Desalination*, **249** (3), 976-982.

Full Text: [2009\Desalination249, 976.pdf](2009/Desalination249,%20976.pdf)

Abstract: This study utilized carbon nanotubes (CNTs) to remove bisphenol A (BPA) from aqueous solution. The surfaces of CNTs were modified by SOCl2/NH4OH under microwave irradiation. The surface characteristics of as-grown and modified CNTs were analyzed by measuring zeta potential, and using a scanning electron microscope, a surface area analyzer and a Fourier transform infrared spectroscope. The specific surface area of modified CNTs exceeded that of as-grown CNTs. The pH(iep) values of as-grown CNTs and modified CNTs were determined to be 4.3 and 6.5, respectively. Some amine functionalities were formed on the surface of modified CNTs; therefore, the Surface of the modified CNTs contained more positive charges than that of the as-grown CNTs. The adsorption kinetics were examined using pseudo first- and second-order models, intraparticle diffusion and Bangham’s models. The equilibrium data were Simulated using Langmuir, Freundlich, Dubinin and Radushkevich (D-R) and Temkin isotherms. The results reveal that the pseudo second-order model and Langmuir isotherm fit the kinetics and equilibrium data, respectively. The adsorption capacity of BPA on the surface of CNTs fluctuates very little with pH in the range of 3-9, suggesting the high stability of CNTs as an adsorbent for BPA over a rather wide pH range. The values of Δ*H* and Δ*S* were calculated to be -11.7 kJ/mol and 46.1 J/mol, respectively. The isotherm and thermodynamic simulations indicate that the adsorption of BPA onto as-grown CNTs proceeds by physisorption process. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Kinetics, Aqueous Solution, Behavior, Bisphenol A, Capacity, Carbon, Carbon Nanotubes, Characteristics, Data, Degradation, Diffusion, Equilibrium, First, Freundlich, Intraparticle Diffusion, Irradiation, Isotherm, Isotherms, Kinetics, Langmuir, Langmuir Isotherm, Microwave, Model, Models, Modified, Modified Carbon, Nanotubes, pH, Potential, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Purification, Removal, Rights, River, Second Order, Second-Order, Second-Order Model, Solution, Sorption, Specific Surface, Specific Surface Area, Stability, Surface, Surface Area, Surface Modification, Surfaces, Thermodynamic, Trihalomethanes, Water, Zeta Potential

? Wu, Y.H., Li, B., Feng, S.X., Mi, X.M. and Jiang, J.L. (2009), Adsorption of Cr(VI) and As(III) on coaly activated carbon in single and binary systems. *Desalination*, **249** (3), 1067-1073.

Full Text: [2009\Desalination249, 1067.pdf](2009/Desalination249,%201067.pdf)

Abstract: In single component system, the adsorption of Cr(VI) and As(III) increase with contact time. Solution pH is found influencing the adsorption. Cr(VI) removal is found to be maximum (98%) at pH = 2. While, As(III) removal is found to be maximum at pH = 6 (77.2%). The adsorption capacity of Cr(VI) is greater than that of As(III) in single component system. Several adsorption isotherms were used to fit the equilibrium data. The adsorption kinetic data of Cr(VI) and As(III) were analyzed and is found fitting well in a pseudo-second-order equation both in single and binary systems. In binary system, the adsorption of As(III) is generally higher than that in single system. The pseudo-second-order rate constant k(2) is 0.5037 g/mg min in binary system larger than 0.0782 g/mg min in single system. However, the presence of As(III) in solution does not significantly influence the capacity of Cr(VI) adsorption on coaly activated carbon (CAC). The complexation between Cr(VI) and As(III) influence the adsorption, resulting in increased adsorption of As(III). The complexation structure of As(III), Cr(VI) and CAC was proposed as A-Cr(VI)-As(III) (A represents the adsorption site on the CAC). (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherms, Adsorption Kinetic, Aqueous-Solutions, Arsenic, Arsenic Removal, As(III), Binary, Biosorption, Capacity, Carbon, Chromium, Complexation, Contact Time, Cr(VI), Cr(VI) Adsorption, Cr(VI) Removal, Data, Drinking-Water, Equilibrium, Hydrogen-Sulfide, Isotherm, Isotherms, Kinetic, Kinetics, Oxidation, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Pseudo-Second-Order Rate, Rate Constant, Reduction, Removal, Rights, Site, Solution, Solution pH, Sorption, Structure, Systems

? Akkaya, G., Uzun, I. and Guzel, F. (2009), Adsorption of some highly toxic dyestuffs from aqueous solution by chitin and its synthesized derivatives. *Desalination*, **249** (3), 1115-1123.

Full Text: [2009\Desalination249, 1115.pdf](2009/Desalination249,%201115.pdf)

Abstract: The adsorption of indigo carmine (IC) and trypan blue (TB) by chitin was kinetically investigated as dependent on temperature and pH. Experimental data obtained at different temperatures for the adsorption of each dyestuff were applied to the pseudo first-order, the pseudo second-order and the intraparticle diffusion rate equations, and the pseudo first-order rate constants (k(1)), the pseudo second-order rate constants (k(2)) and the intraparticle diffusion rate constants (k(p)) at these temperatures were calculated, respectively. In addition, adsorption isotherms of each dyestuff by chitin were also determined at different temperatures. It was seen that adsorption isotherms fitted the H type. Chitin was then modified via ring-opening reaction with cyclic acid anhydrides (succinic, maleic and 1,2,4-benzenetricarboxylic) in lithium chloride/N,N-dimethylacetamide. Chitin derivatives obtained were compared according to their capabilities to adsorb IC and TB. It was determined that IC and TB were more adsorbed by chitin modified with 1,2,4-benzenetricarboxylic anhydride (CBA) and chitin modified with maleic anhydride (CMA), respectively. 31.33% of IC (C-0: 300 ppm) by CBA, and 44.29% of TB (C-0: 200 ppm) by CMA were adsorbed. Then, the adsorption of IC by CBA and of TB by CMA was kinetically investigated as dependent on temperature. The constants k(1), k(2) and k(p) related to the adsorption of IC by CBA and of TB by CMA were calculated as stated above. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherms, Aqueous Solution, Chitin, Chitosan, Cyclic Anhydride, Data, Diffusion, Dyestuff, First Order, Intraparticle Diffusion, Isotherms, Kinetics, Lithium, Modified, pH, Pseudo First Order, Pseudo First-Order, Pseudo Second Order, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Constants, Reactive Dyes, Removal, Retinal Ganglion-Cells, Rights, Ring-Opening Reaction, Second Order, Second-Order, Solution, Temperature, Thermodynamics, Toxic, Trypan Blue, Wastes, Water

? Kannan, C., Buvaneswari, N. and Palvannan, T. (2009), Removal of plant poisoning dyes by adsorption on Tomato Plant Root and green carbon from aqueous solution and its recovery. *Desalination*, **249** (3), 1132-1138.

Full Text: [2009\Desalination249, 1132.pdf](2009/Desalination249,%201132.pdf)

Abstract: The organic dyes directly pollute the soil, water, plants and all living systems in the environment. The dyes like cationic Methylene blue (MB) and Crystal violet (CV) adsorption has been studied on Tomato Plant Root powder (TPR) and green carbon from aqueous solution for identifying the plant poisoning nature of cationic dyes. TPR powder is a cellulose material and green carbon is prepared from TPR powder by an ecofriendly method. The dyes adsorption mechanism on basic surface of cellulose and neutral Surface of green carbon are correlated to evaluate the plant poisoning nature of organic dyes. The adsorption parameters were optimized to maximum adsorption. The maximum uptake of both dyes on TPR was 97% at 15 min and on carbon is 18% (CV) & 20% (MB) at 30 min. The adsorptions of MB and CV on TPR powder followed Freundlich and Langmuir adsorption isotherms and pseudo second order kinetics. The Δ*S*º, Δ*H*º and Δ*G*º of adsorption on TPR are calculated. The dyes recovery has been studied from dyes adsorbed TPR and green carbon. The adsorption mechanism and dye recovery studies proved the plant poisoning nature of MB and CV. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Adsorption Mechanism, Aqueous Solution, Basic Dye, Biodegradation, Carbon, Cationic Dyes, Cellulose, Crystal Violet, Dye, Dyes, Environment, Fly-Ash, Freundlich, Green Carbon, Isotherms, Kinetics, Langmuir, Living, Low-Cost Adsorbents, Mb, Mechanism, Methylene Blue, Methylene-Blue, Organic, Plant, Plant Poisoning, Plants, Poisoning, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Recovery, Removal, Rights, Sawdust, Second Order, Second Order Kinetics, Second-Order, Soil, Solution, Sorption, Surface, Systems, TPR, TPR Powder, Uptake, Waste-Water, Water

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Full Text: [2009\Desalination249, 1180.pdf](2009/Desalination249,%201180.pdf)

Abstract: The feasibility of chitosan and cross-linked chitosan beads as efficient adsorbents for the removal of Acid Blue 25 (AB 25) and Acid Red 37 (AR 37) from aqueous Solution was studied by using batch adsorption techniques. Glutaraldehyde (GLA) and sulphuric acid were employed as cross-linking reagents. The effect of process parameters like pH. agitation period, agitation rate and concentrations of dyes on the extent of AR 37 and AB 25 adsorption by chitosan and cross-linked chitosan beads was investigated. The best interpretation for the equilibrium data was given by the Langmuir isotherm. while the pseudo-second-order kinetic model could best describe the adsorption of these acid dyes. Thermodynamic parameters Such as enthalpy change (ΔHº), free energy change (ΔGº) and entropy change (ΔSº) were estimated and adsorption process was spontaneous and exothermic. The desorbed chitosan, chitosan-GLA and chitosan-H2SO4 beads can be reused to adsorb the acid dyes. Results also showed that chitosan, chitosan-GLA and chitosan-H2SO4 beads were favourable adsorbers. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid Blue, Acid Blue 25, Acid Dyes, Activated Carbon, Adsorbents, Adsorption, Adsorption Behavior, Adsorption Isotherm, Adsorption Kinetic, Adsorption Thermodynamic, Agitation, Anionic Dyes, Aqueous-Solutions, Basic Dye, Batch, Batch Adsorption, Beads, Chitosan, Cross-Linked, Cross-Linked Chitosan, Crosslinked Chitosan, Crosslinking, Data, Desorption, Dyes, Energy, Enthalpy, Entropy, Equilibrium, Exothermic, Feasibility, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Low-Cost Adsorbents, Mass-Transfer, Methylene-Blue, Model, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Reactive Dye, Removal, Rights, Sorption, Spontaneous, Sulphuric Acid, Techniques, Thermodynamic, Thermodynamic Parameters, Waste-Water

? El-Rahim, W.M.A., El-Ardy, O.A.M. and Mohammad, F.H.A. (2009), The effect of pH on bioremediation potential for the removal of direct violet textile dye by *Aspergillus niger*. *Desalination*, **249** (3), 1206-1211.

Full Text: [2009\Desalination249, 1206.pdf](2009/Desalination249,%201206.pdf)

Abstract: Alkaline and acidic media have been used in the textile dye industry. depending on the fabric nature. The bioremoval of textile direct violet dye by *Aspergillus niger* fungal strain was studied. The effect of pH on dye bioremoval was investigated at a pH range from 2 to 11. The direct violet dye bioremoval reached maximum with 92.4%, 64.0%. 91.4%, and 62.3% at pH values of 2, 3, 8, and 9, respectively, at 24 h of incubation. The percentages of removal rate after 72 h incubation were 98.9, 97.3, 94.0, 95.0, 97.0. and 97.3 at pH 2, 3, 6, 7, 8. and 9, respectively. The optimum pH values were 2, 3, 8, and 9 for direct dye removal. At the end of the experiments, the treatment with fungal strain could reduce COD value of synthetic dye Solution by 76-91%. Pseudo first and second order kinetic models were applied to evaluate differences in the biosorption rates and uptakes of textile dye. Pre-equilibrium biosorption of direct violet dye onto fungus under different dye concentrations followed a pseudo second order kinetic model with a high degree of correlation coefficients (R2>0.99), and the calculated values of *q*e nearly matched the experimental values of textile dye during the biotreatment process. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, *Aspergillus niger*, Batch Fermenter, Bioremediation, Bioremoval, Biosorption, Biosorption Model, Cod, Correlation, Decolorization, Dye, Dye Removal, Effluent, Experimental, Experiments, First, Fungus, Kinetic, Kinetic Model, Kinetic Models, Media, Model, Models, pH, pH Effect, Potential, Pseudo Second Order, Pseudo-Second-Order, Rates, Removal, Rights, Second Order, Second-Order, Sorption, Textile Dye, Textile Violet Dye Removal, Treatment, Value, Water, Yeast

? Wawrzkiewicz, M. and Hubicki, Z. (2009), Application of nitroso-R-salt in modification of strongly basic anion-exchangers Amberlite IRA-402 and Amberlite IRA-958. *Desalination*, **249** (3), 1228-1232.

Full Text: [2009\Desalination249, 1228.pdf](2009/Desalination249,%201228.pdf)

Abstract: The batch method was applied in order to determine the influence of phase contact time, solution pH and temperature as well as HCl concentration on nitroso-R-salt (NRS) deposition on the strongly basic anion-exchangers Amberlite IRA-402 and Amberlite IRA-958. The equilibrium sorption of NRS from 1×10-4mol/dm3 solution was achieved after 60 min. The amount of NRS adsorbed decreased with increasing hydrochloric acid concentration. A significant increase of NR5 uptake is observed with the increase of initial Solution pH up to 3 for Amberlite IRA-402. Amberlite IRA-402 and Amberlite IRA-958 in chloride form as well as modified by means of NRS were used for recovery of Pd(II) ions from 0.1, 0.5 and 1.0 mol/dm(3) HCl solutions. The studied anion-exchangers in NRS form as far as their application in removal of Pd(II) chlorocomplexes is concerned can be presented in the order: Amberlite IRA-402>Amberlite IRA-958. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Anion-Exchanger, Application, Aqueous-Solution, Batch, Batch Method, Chelating Resin, Chloride, Cobalt, Concentration, Deposition, Equilibrium, Ions, Metal-Ions, Modification, Modified, Nitroso-R-Salt, Palladium, Palladium(II), Pd(II), pH, Preconcentration, Recovery, Removal, Rights, Separation, Solid-Phase Spectrophotometry, Solution, Solution pH, Solutions, Sorption, Sorption, Temperature, Trace Amounts, Uptake

? Baker, H.M. and Ghanem, R. (2009), Evaluation of treated natural zeolite for the removal of o-chlorophenol from aqueous solution. *Desalination*, **249** (3), 1265-1272.

Full Text: [2009\Desalination249, 1265.pdf](2009/Desalination249,%201265.pdf)

Abstract: The adsorption characteristics of o-chlorophenol by treated Jordanian natural zeolite were investigated. The treatment was done using urea and thiourea. Column experiments were performed to evaluate the effects of various experimental parameters on the removal of o-chlorophenol, such as: calcined of zeolite, contact time, the pH and the initial concentration. The rate of removal of o-chlorophenol from aqueous solution by the modified zeolite was studied in batch conditions at different temperatures. Different kinetic models were used to evaluate the obtained results such as pseudo-second-order, intra-particle diffusion and Elovich models. The R 2 values showed that the pseudo-second-order equation was the most appropriate model for the description of o-chlorophenol transport. The activation energy of sorption was calculated using pseudo-second-order rate constant, Desorption was achieved using methanol solution (30%, v/v). The treated natural zeolite was found to be Suitable for reuse without noticeable loss of adsorption capacity. (C) 2009 Published by Elsevier B.V.

Keywords: Activation, Activation Energy, Adsorption, Adsorption Capacity, Aqueous Solution, Batch, Benzene, Calcined, Capacity, Characteristics, Column, Concentration, Contact Time, Desorption, Diffusion, Elovich, Energy, Equilibrium Isotherm, Experimental, Experiments, Intra Particle Diffusion, Intra-Particle Diffusion, Intraparticle Diffusion, Jordanian Natural Zeolite, Kinetic, Kinetic Models, Kinetics, Methanol, Model, Models, Modified, Modified Zeolite, Natural, Natural Zeolite, O-Chlorophenol, pH, Phenol, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Pseudo-Second-Order Rate, Rate Constant, Removal, Reuse, Solution, Sorption, Toluene, Transport, Treatment, Zeolite

? Anirudhan, T.S. and Radhakrishnan, P.G. (2009), Kinetic and equilibrium modelling of Cadmium(II) ions sorption onto polymerized tamarind fruit shell. *Desalination*, **249** (3), 1298-1307.

Full Text: [2009\Desalination249, 1298.pdf](2009/Desalination249,%201298.pdf)

Abstract: Formaldehyde polymerized tamarind fruit shell (FPTFS) having sulphonic acid groups was prepared and tested as an adsorbent for the adsorption of cadmium(II) ions from water and wastewater. Batch experiments were conducted to determine the adsorption efficiency of the adsorbent. The maximum adsorption of Cd(II) occurred at pH 7.0. The equilibrium was established in 3h. Kinetic data were modeled using pseudo-first-order, pseudo-second-order and Ritchie modified second-order model. The equilibrium data were described using Langmuir, Freundlich, Sips and Toth isotherm equations. The results of error analysis indicated that the best parameters for kinetic and isotherm equations were obtained by hybrid fractional error function method. The kinetic data could be well described by Ritchie modified second-order expression and the adsorption capacities calculated by the model were close to those determined by experiments. The adsorption isotherm data could be well fitted to the Sips isotherm model. The efficiency of Cd(II) removal by the FPTFS decreased with an increase in ionic strength of the solution. The efficiency of FPTFS was tested using fertilizer industry wastewater. About 98.0% of the adsorbed Cd(II) ions call be released from the spent adsorbent by treatment with 0.1 M HCl solution. Consecutive adsorption/desorption (4 cycles) showed the feasibility of the FPTFS for Cd(II) adsorption. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Capacities, Adsorption Isotherm, Adsorption, Desorption, Adsorptive Removal, Analysis, Aqueous-Solutions, Banana Stem, Bone Char, Cadmium(II), Cadmium(II) Ions, Cd(II), Cd(II) Adsorption, Cd(II) Ions, Cd(II) Removal, Coconut Coir Pith, Data, Efficiency, Equilibrium, Error, Error Analysis, Experiments, Expression, Feasibility, Fertilizer, Freundlich, Function, Functional-Groups, Heavy-Metal Ions, Hybrid, Ionic Strength, Ions, Isotherm, Isotherm Equations, Isotherm Model, Kinetic, Kinetic Parameters, Langmuir, Lead(II), Model, Modelling, Modified, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Rights, Second Order, Second-Order, Second-Order Model, Solution, Sorption, Strength, Tamarind Fruit Shell, Treatment, Waste-Water, Wastewater, Wastewater-Treatment, Water

? Ergene, A., Ada, K., Tan, S. and Katircioğlu, H. (2009), Removal of Remazol Brilliant Blue R dye from aqueous solutions by adsorption onto immobilized *Scenedesmus quadricauda*: Equilibrium and kinetic modeling studies. *Desalination*, **249** (3), 1308-1314.

Full Text: [2009\Desalination249, 1308.pdf](2009/Desalination249,%201308.pdf)

Abstract: The green algae Scenedesnnus quadricauda was immobilized in alginate gel beads. The immobilized active (IASq) and heat inactivated S. quadricauda (IHISq) were used for the removal of Remazol Brilliant Blue R (Cl 61200, Reactive Blue 19, RBBR) from aqueous solutions in the concentration range 25-200 mg L-1. At 150 mg L-1 initial dye concentration the IASq and IHISq exhibited the highest dye uptake capacity at 30°C, at the initial pH value of 2.0. At the same initial dye concentration in the batch system the adsorption capacity was determined for IASq as 44.2: 44.9 and 45.7 mg g-1 in 30. 60 and 300 min, respectively. After 300 min the adsorption capacity hardly changed during the adsorption time. The IHISq of adsorption capacity was observed as 47.6; 47.8 and 48.3 mg g-1 in 30, 60 and 300 min. respectively. After 300 min the adsorption capacity was not changed for 24 h. The Langmuir, Freundlich, Temkin, Dubinin-Radushkevich and Flory-Huggins isotherm models were used to fit the equilibrium biosorption data. The Langmuir, Freundlich and Dubinin-Radushkevich equations have better coefficients than Temkin and Flory-Huggins equation describing the RBBR dye adsorption onto IASq and IHISq. The monomolecular biosorption capacity of the biomass was found to be 68 and 95.2 mg g-1 for IASq and IHISq, respectively. From the Dubinin-Radushkevich model. the mean free energy was calculated as 6.42-7.15 kJ mol-1 for IASq and IHISq, indicating that the biosorption of dye was taken place in physical adsorption reactions. The experimental data were also tested in terms of kinetic characteristics and it was determined that the biosorption process of dye was well explained with pseudo-second-order kinetics. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Adsorption, Adsorption Capacity, Algae, Alginate, Aqueous Solutions, Batch, Batch System, Beads, Biomass, Biosorption, Biosorption, Capacity, Characteristics, Concentration, Data, Decolorization, Dye, Dye Adsorption, Energy, Equilibrium, Equilibrium and Kinetic Modeling, Experimental, Extraction Algal Waste, Freundlich, G Reactive Dye, Gel, Green Algae, Immobilized, Immobilized Scenedesmus Quadricauda, Ions, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetic Modeling, Kinetics, L1, Langmuir, Methylene-Blue, Model, Modeling, Models, pH, pH Value, Physical, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Remazol Brilliant Blue, Remazol Brilliant Blue R, Removal, Rhizopus-Arrhizus, Rights, Solutions, Uptake, Value, Water

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Full Text: [2010\Desalination250, 105.pdf](2010/Desalination250,%20105.pdf)

Abstract: Chitosan was cross-linked using glutaraldehyde in the presence of magnetite. The resin obtained was chemically modified through the reaction with tetraethylenepentamine followed by glycidyl trimethylammonium chlorid to produce chitosan bearing amine (R1) and chitosan bearing both amine and quaternary ammonium chloride moieties (R2), respectively. The quaternary amine resin (R2) showed a higher affinity towards the uptake of Cr(VI) from alkaline medium, where an uptake value of 2.8 mmol/g was reported at pH 8 and 25°C. The nature of interaction of R2 with chromate in alkaline medium was clarified. The resin Kinetics at different temperatures and thermodynamic parameters of the uptake process in alkaline medium were obtained. The uptake of Cr(VI) from different electrolyte solutions was studied. Regeneration curves for the desorption of Cr(VI) from R2 were studied. The adsorbed chromate anions was regenerated effectively (desorption ratio similar to 98%) using a mixture of 2 M NaCl and 0.5 M NaOH. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Ammonium, Anions, Aqueous Solutions, Chitosan, Chloride, Chromate, Chromate Ion-Exchange, Chromate Oxyanions, Chromium, Cr(VI), Cross-Linked, Desorption, Glutaraldehyde, Interaction, Kinetics, Magnetic, Magnetite, Metals, Modified, NaCl, NaOH, pH, Quaternary Amine, Regeneration, Removal, Resin, Resins, Rights, Solutions, Sorbents, Thermodynamic, Thermodynamic Parameters, Uptake, Value, Waste, Water

? El-Halwany, M.M. (2010), Study of adsorption isotherms and kinetic models for Methylene Blue adsorption on activated carbon developed from Egyptian rice hull (Part II). *Desalination*, **250** (1), 208-213.

Full Text: [2010\Desalination250, 208.pdf](2010/Desalination250,%20208.pdf)

Abstract: Adsorption of Methylene Blue (MB) from aqueous solutions on activated carbon prepared from Egyptian rice hulls (ERHA) is studied experimentally. Results obtained indicate that the removal efficiency of Methylene Blue at 25ºC exceeds 99% and that the adsorption process is highly pH-dependent. Results showed that the optimum pH lies between 5 and 9. The amount of Methylene Blue adsorbed form aqueous solution increases with the increase of the initial Methylene Blue concentration and temperature. Smaller adsorbent particle adds to increase the percentage removal of Methylene Blue. The results fit the BET model for adsorption of MB on ERHA, corroborating the assumption of that the adsorbate molecules could be adsorbed in more than one layer thick on the surface of the adsorbent. A comparison of kinetic models at different conditions (pH, Temperature, adsorbent particle size, adsorbent dose and adsorbate concentration) applied to the adsorption of Methylene Blue on the adsorbent was evaluated for the pseudo first-order, the pseudo second-order, Elovich and intraparticle diffusion kinetic models, respectively. Results showed that the pseudo second-order kinetic model correlate the experimental data well. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Adsorption Isotherms, Aqueous Solution, Aqueous Solutions, BET, Carbon, Chemical Modified and Agricultural-by-Product, Comparison, Concentration, Data, Diffusion, Efficiency, Effluents, Elovich, Experimental, First Order, Intraparticle Diffusion, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, MB, Methylene Blue, Model, Models, Particle Size, pH, pH-Dependent, Pseudo First Order, Pseudo First-Order, Pseudo Second Order, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Removal Efficiency, Rice, Rice Hull, Rice Hulls, Rights, Second Order, Second-Order, Size, Solution, Solutions, Surface, Surfactants, Temperature, Thermodynamics Parameters, Water-Treatment

? Wang, X.S. and Zhang, B. (2010), Sorption of Al(III) from aqueous solution by fresh macrophyte alligator weed: Equilibrium and kinetics. *Desalination*, **250** (2), 485-489.

Full Text: [2010\Desalination250, 485.pdf](2010/Desalination250,%20485.pdf)

Abstract: The removal of Al (III) ions from aqueous solution by locally abundantly low-cost fresh macrophyte, alligator weed. was examined in batch system. Effect of initial solution pH on Al(III) adsorption was investigated and the Al(III) species present in aqueous solution were identified. The main functional groups of the alligator weed were characterized by Fourier transform infrared spectrometer (FT-IR). The equilibrium data fitted to Freundlich and Langmuir isotherms satisfactorily. The pseudo-second-order equation fitted the kinetic data very well. The intraparticle diffusion played an important role in the Al(III) sorption process. Al (III) ions were favorably adsorbed by alligator weed and the values of *K*f and 1/n (Freundlich constant) at 25ºC and pH 3.5 were found as 1.9963 (mg/g)/(mg/L)(1/n) and 0.7875, respectively, which are comparable to those of granular activated carbon (2.20 (mg/g)/(mg/L)(1/n) and 0.8695, respectively). (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Al(III), Aluminum, Aqueous Solution, Batch, Batch System, Biomass, Carbon, Data, Diffusion, Equilibrium, Freundlich, Freundlich Constant, FT-IR, FTIR, Functional Groups, Granular Activated Carbon, Intraparticle Diffusion, Ions, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherms, Low Cost, Low-Cost Adsorbent, Metal-Ions, Moss, pH, Pollution, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Removal, Rights, Role, Solution, Sorption, Sorption Process, Species, Weed

? Alam, Z., Inamuddin and Nabi, S.A. (2010), Synthesis and characterization of a thermally stable strongly acidic Cd(II) ion selective composite cation-exchanger: Polyaniline Ce(IV) molybdate. *Desalination*, **250** (2), 515-522.

Full Text: [2010\Desalination250, 515.pdf](2010/Desalination250,%20515.pdf)

Abstract: A polymer supported organic-inorganic composite and strongly acidic cation-exchanger polyaniline Ce(IV) molybdate was chemically synthesized and demonstrated to be an excellent ion-exchange material due to its high selectivity for Cd(II), thermal stability and fast elution of an exchangeable H+ ion. The material was characterized for its ion exchange properties to study its cation-exchange behavior. Cd(II) selectivity depends upon the distribution coefficient in several solvent systems. The selectivity of this material varied depending upon its composition and the composition of the eluting solvent. Its selectivity was examined and some important binary separations such as Cd(II)-Pb(II). Cd(II)-Hg(II), Cd(II)-Zn(Il) and Cd(Il)-Ni(II) were also achieved. The physico-chemical properties of the material were also studied using C, H, N elemental analysis, ICP-MS, FTIR, TGA-DTA, X-ray and SEM studies. (C) 2009 Published by Elsevier B.V.

Keywords: Organic-Inorganic Composite, Strongly Acidic Cation-Exchanger, Polyaniline Ce(IV) Molybdate, Thermal Stability, Metal-Ions, Phosphate, Removal, Zirconium, Separation, Electrode, Water, Lead

? Al-Anber, M.A. (2010), Removal of high-level Fe3+ from aqueous solution using natural inorganic materials: Bentonite (NB) and quartz (NQ). *Desalination*, **250** (3), 885-891.

Full Text: [2010\Desalination250, 885.pdf](2010/Desalination250,%20885.pdf)

Abstract: Decontamination of high-level Fe3+ ions from a model aqueous solution using natural inorganic Quartz (NQ) and Bentonite (NB) has been studied. The adsorption equilibrium studies are performed with a constant initial Fe3+ ion concentrations (namely 100, 200,300 and 400 mg.L-1) and varying adsorbent weight. The adsorption percentages of Fe3+ ions increase sharply by increasing adsorbent doses, in which the adsorption percentage of Fe3+ using NB (approx. 60%) is found higher than in case of NQ (approx. 40%) in whole adsorption dosages. The maximum adsorption percentages of Fe3+ using both adsorbents are achieved within the first 60 minuets, and then desorption process is taken place. As the initial concentration of ions increases the percentage removal using NB decreases, while the adsorption using NQ is less affected by the initial concentration; it is found 40% in whole different initial concentration (50 - 400 mg.L-1). The best temperature for the maximum adsorption is found 30 - 40ºC for both adsorbents. The obtained experimental data has well described by Freundlich isotherm model into both NQ and NB. The Freundlich constant K-f for the adsorption of Fe3+ using NB is greater than using of NQ for the initial concentration 400 mg.L-1. The negative value of Delta G degrees confirms the feasibility of the process and the spontaneous nature of adsorption with a high preference for metal ions to adsorb onto NB (ΔGº = -13.9) more easily than NQ (ΔGº = -13.4). (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Equilibrium, Aqueous Solution, Bentonite, Concentration, Data, Desorption, Equilibrium, Equilibrium Studies, Experimental, Feasibility, First, Freundlich, Freundlich Constant, Freundlich Isotherm, Freundlich Isotherm Model, Heavy Metals, Heavy-Metals, Ions, Iron, Iron, Iron(III), Isotherm, Isotherm Model, Kinetics, Langmauire Isotherm, Metal, Metal Ions, Model, Natural, Preference, Quartz, Removal, Rights, Solution, Sorption, Temperature, Thermodynamics, Value, Waste-Water, Wastewater

? Al-Mutairi, N.Z. (2010), 2,4-Dinitrophenol adsorption by date seeds: Effect of physico-chemical environment and regeneration study. *Desalination*, **250** (3), 892-901.

Full Text: [2010\Desalination250, 892.pdf](2010/Desalination250,%20892.pdf)

Abstract: The main goal of this research was to evaluate the adsorption capability of non-conventional, low-cost adsorbents at elevated 2,4-dinitrophenol (DNP) concentrations. Commercial activated carbon was also evaluated in an attempt to identify the sorption mechanism. Isotherms for adsorption of 2,4-dinitrophenol from water and basal salt medium onto date seeds and activated carbon were determined. These isotherms were modeled by the Freundlich isotherm. The experimental results showed that only 0.5 g of date seeds, with a 125 ml salt medium. were a suitable adsorbent for the removal of DNP from samples. The studies showed date seeds to be an efficient sorbent material for DNP removal from solutions. Of the parameters investigated, pH was determined to be most crucial, with an optimum pH range of 4.0 to 5.0 for good DNP removal. The DNP adsorption capacity of both adsorbents exceeded the original value of the raw material when regenerated by microwave irradiation. The regeneration efficiency of date seeds was 96% compared to 85% of activated carbon. In addition, the use of basal salt medium solution does not appear to play a significant role in DNP adsorption by activated carbon compared to water medium. However, the basal salt medium was associated with a higher adsorption capacity when used with date seeds. Finally, the treatment of a high DNP concentration with date seeds and activated carbon significantly reduced the toxicity of the DNP effluent. (C) 2009 Published by Elsevier B.V.

Keywords: 2,4-Dinitrophenol, Activated Carbon, Activated-Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption by Activated Carbon, Adsorption Capacity, Aqueous-Solutions, Capacity, Carbon, Concentration, Date Seeds, Efficiency, Environment, Equilibrium, Experimental, Freundlich, Freundlich Isotherm, Heavy-Metals, Irradiation, Isotherm, Isotherms, Low Cost, Low Cost Adsorbents, Low-Cost Adsorbents, Mechanism, Microwave, Orange Peel, pH, Phenolic-Compounds, Regeneration, Removal, Research, Role, Salt, Solution, Solutions, Sorbent, Sorption, Sorption Mechanism, Toxicity, Treatment, Value, Waste-Water, Water, Water Treatment-Plant

? Jain, S. and Jayaram, R.V. (2010), Removal of basic dyes from aqueous solution by low-cost adsorbent: Wood apple shell (*Feronia acidissima*). *Desalination*, **250** (3), 921-927.

Full Text: [2010\Desalination250, 921.pdf](2010/Desalination250,%20921.pdf)

Abstract: The adsorption of two basic dyes, methylene blue (MB) and crystal violet (CV) on wood apple shell (WAS) were investigated using a batch adsorption technique. A series of experiments were undertaken in an agitated batch adsorber to assess the effect of the system variables such as solution pH, dye concentration and temperature. Removal of dyes was observed to be most effective at higher pH. Freundlich and Langmuir isotherm models were applied to the equilibrium data. The results showed that Langmuir equation fits better than the Freundlich equation. It was observed that the WAS adsorbent showed higher adsorption capacity for crystal violet (130 mg/g) than methylene blue (95.2 mg/g). The FTIR studies indicate that the interaction of dye and WAS surface is via the nitrogen atoms of the adsorbate and oxygen groups of the adsorbent. The adsorption of dyes onto WAS proceeds according to a pseudo-second-order model. Thermodynamic parameters such as free energy (Δ*G*º), enthalpy (Δ*H*º) and entropy (Δ*S*º) were also calculated. The studies show that WAS, a lignocellulosic inexpensive material, can be an alternative to other expensive adsorbents used for dye removal in wastewater treatment. (C) 2009 Published by Elsevier B.V.

Keywords: Activated Carbons, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherm, Alternative, Aqueous Solution, Basic Dyes, Batch, Batch Adsorption, Capacity, Concentration, Crystal Violet, Data, Dye, Dye Removal, Dyes, Energy, Enthalpy, Entropy, Equilibrium, Experiments, Freundlich, Freundlich Equation, FTIR, FTIR Studies, Interaction, Isotherm, Kinetic Equation, Kinetics, Langmuir, Langmuir Equation, Langmuir Isotherm, Liquid-Phase Adsorption, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Malachite Green, MB, Methylene Blue, Methylene-Blue Adsorption, Model, Models, Nitrogen, Oxygen, pH, Photocatalytic Degradation, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Solution, Sorption, Surface, Temperature, Textile Effluent, Thermodynamic, Thermodynamic Parameter, Thermodynamic Parameters, Treatment, Wastewater, Wastewater Treatment, Wood, Wood Apple Shell

? Chou, W.L., Wang, C.T. and Huang, K.Y. (2010), Investigation of process parameters for the removal of polyvinyl alcohol from aqueous solution by iron electrocoagulation. *Desalination*, **251** (1-3), 12-19.

Full Text: [2010\Desalination251, 12.pdf](2010/Desalination251,%2012.pdf)

Abstract: The feasibility of polyvinyl alcohol (PVA) removal from aqueous solution was investigated using iron electrocoagulation. Several parameters, including type of electrode pair, applied voltage, supporting electrolytes, and solution temperature were investigated. The effects of applied voltage, supporting electrolyte, and solution temperature on PVA removal efficiency and specific energy consumption were also investigated. Experimental results indicated that a Fe/Al electrode pair was the most efficient choice of the four electrode pairs tested in terms of PVA removal efficiency. The optimum applied voltage, supporting electrolyte concentration, and solution temperature were found to be 10 V, 100 mg L-1 NaCl, and 298 K, respectively. A pseudo-second-order kinetic model provided a good fit to experimental results at various applied voltages and solution temperatures. In addition, the activation energy was calculated to be 49.45 J mol-1 based on pseudo-second-order rate constants from the Arrhenius equation, indicating that PVA precipitation in aqueous solution was attributable to the electrocoagulation process. (c) 2009 Elsevier B.V. All rights reserved.

Keywords: Activation, Activation Energy, Adsorption, Alcohol, Aluminum, Aqueous Solution, Choice, Concentration, Consumption, Degradation, Efficiency, Electrocoagulation, Energy, Energy Consumption, Enhanced Fenton Reaction, Experimental, Feasibility, Iron, Kinetic, Kinetic Model, Kinetics, Kinetics, L1, Model, NaCl, Oxidation, Phosphate, Plate Electrodes, Poly(Vinyl Alcohol), Polyvinyl Alcohol, Polyvinyl Alcohol (PVA), Precipitation, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Pseudo-Second-Order Rate, PVA Removal, Rate Constants, Removal, Removal Efficiency, Rights, Solution, Specific Energy Consumption, Temperature, Waste-Water Treatment

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Full Text: [2010\Desalination251, 41.pdf](2010/Desalination251,%2041.pdf)

Abstract: Ammonium ion removal from aqueous solution by Petra clay minerals has been established. To study the efficiency of the Petra clay as sorbent, the effect of relevant parameters, such as temperature, contact time, pH and initial ammonium (NH4+) concentration were examined. Kinetics experiments were also done at different parameters. The pseudo first-order. pseudo second-order kinetic models and intra-particle diffusion model were used to describe the kinetic data. The pseudo second-order kinetic model provided excellent data fitting (R2 > 0.99), and the rate constant for sorption was predicted. Activation energy of sorption has also evaluated as 22.60 kJ/mol based on the pseudo second-order rate constants, the findings of this investigation suggest that physical sorption plays a role in controlling the sorption rate. Ammonium uptake rate was controlled by particle diffusion at different variables. (c) 2009 Elsevier B.V. All rights reserved.

Keywords: Activation, Activation Energy, Adsorption, Ammonium, Ammonium Ion, Aqueous Solution, Aqueous-Solutions, Clay, Clay Minerals, Concentration, Data, Diffusion, Diffusion Model, Efficiency, Energy, Equilibrium, Exchange Method, Experiments, First Order, Humic-Acid, Interaction, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Investigation, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Minerals, Model, Models, Natural, Particle Diffusion, Petra Clay, pH, Physical, Pseudo First Order, Pseudo First-Order, Pseudo Second Order, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Constant, Rate Constants, Removal, Removal, Rights, Role, Second Order, Second-Order, Silicate Minerals, Solution, Sorbent, Sorption, Temperature, Thermodynamic Aspects, Uptake, Wastewater, Water, Zeolite

? Majumdar, S.S., Das, S.K., Chakravarty, R., Saha, T., Bandyopadhyay, T.S. and Guha, A.K. (2010), A study on lead adsorption by *Mucor rouxii* biomass. *Desalination*, **251** (1-3), 96-102.

Full Text: [2010\Desalination251, 96.pdf](2010/Desalination251,%2096.pdf)

Abstract: Removal of lead from its aqueous solutions by adsorption on different biomasses was studied. Mucor rouxii biomass (MRB) had been found to be the most efficient in this respect and removed more than 90% of lead from its aqueous solution. Adsorption of lead by the biomass was dependent on pH and temperature. Maximum sorption was noted at the pH range of 5.0-6.0 and an increase in temperature above 30ºC resulted in the decrease in adsorption indicating the exothermic nature of the process. The adsorption process was very fast initially, and around 70% of the total adsorption was completed within the first 10 min. The process is found to follow the pseudo second order rate kinetics throughout the period. Langmuir isotherm model fitted well to describe the isotherm data. Scanning electron micrographs showed homogeneous accumulation of lead ions on the surface of the biomass. From the FTIR study, involvement of various functional groups like amine, carboxyl, phosphate, etc. for the binding of lead ions was evident. Blocking of these functional groups indicated major involvement of phosphate group for metal ions binding. Lead ions could be desorbed from the loaded biomass with elution with 0.1 M hydrochloric acid. (c) 2009 Elsevier B.V. All rights reserved.

Keywords: Accumulation, Adsorption, Aqueous Solution, Aqueous Solutions, Aqueous-Solution, Binding, Biomass, Biosorption, Biosorption, Cadmium, Copper, Data, Desorption, Elution, Exothermic, First, FTIR, Functional Groups, Heavy-Metals, Ions, Isotherm, Isotherm Model, Kinetics, Laminaria-Japonica, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Lathyrus-Sativus, Lead, Lead Removal, Mechanism, Metal, Metal Ions, Model, Mucor Rouxii, pH, Phosphate, Pseudo Second Order, Pseudo-Second-Order, Range, Rate Kinetics, Removal, Rights, Second Order, Second-Order, Solution, Solutions, Sorption, Surface, Temperature

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Full Text: [2010\Desalination251, 112.pdf](2010/Desalination251,%20112.pdf)

Abstract: The chemical interaction between biosorbent functional groups and metal ion species in solution can slightly be altered by chemical treatment of biosorbent surface. The biosorbent kinetics and mechanism for copper(II) biosorption onto pine cone powder and 0.15 mol dm-3 NaOH treated pine cone powder were determined during batch kinetics with the variation in biosorption temperature and initial copper(II) concentration. Results from this study revealed that surface diffusion of copper(II) is not rate-controlling as observed by the failure of both the pseudo-first and modified pseudo-first order model to discribe the kinetic data. The pseudo-second order model gave a better description of the kinetic data and was able to correlate the model constants with process variables for both samples. Activation energies and thermodynamic parameters of activation obtained from the pseudo-second order model all indicate that the mechanism for copper(II) biosorption on both samples differ. The diffusion partten is complex for the biosorption process, involving pore and film diffusion in the rate determining step and did not follow the same pattern for both samples. Pseudo-isotherms were generated to confirm the fit of the experimental data to the predictions of the pseudo-second order model. It was observed that the generated isotherm data fitted better to the Pseudo-Langmuir-1 isotherm indicating that biosorption was indeed a monolayer coverage of the biosorbent surface confirming the applicability of this model. Effect of initial solution pH and desorption studies confirm the predominance of a slightly different mechanism using both samples. (c) 2009 Elsevier B.V. All rights reserved.

Keywords: Activation, Activation Energy, Adsorption, Aqueous-Solutions, Batch, Biosorbent, Biosorption, Cadmium Ion, Chemical, Concentration, Copper(II), Copper(II) Biosorption, Coverage, Data, Desorption, Desorption Studies, Diffusion, Equilibrium, Experimental, Failure, Film Diffusion, Functional Groups, Interaction, Isotherm, Isotherms, Kinetic, Kinetics, Mechanism, Metal, Model, Modeling, Modified, Monolayer, NaOH, NaOH Treatment, Palm Kernel Fiber, Pattern, pH, Predictions, Pseudo First Order, Pseudo Second Order, Pseudo-First and, Pseudo-First Order, Pseudo-First-Order, Pseudo-Isotherms, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Removal, Rights, Solution, Sorption, Species, Surface, Surface Diffusion, Temperature, Thermodynamic, Thermodynamic Parameters, Treatment

? Ahamad, K.U. and Jawed, M. (2010), Kinetics, equilibrium and breakthrough studies for Fe(II) removal by wooden charcoal: A low-cost adsorbent. *Desalination*, **251** (1-3), 137-145.

Full Text: [2010\Desalination251, 137.pdf](2010/Desalination251,%20137.pdf)

Abstract: Groundwater is the main source of drinking water for rural communities which contains 1-10 mg/L of Fe(II). Community prepared wooden charcoal is used to remove excess Fe(II). The present work evaluates the wooden charcoal for Fe(II) removal. The Fe(II) uptake equilibrates within 150-180 min. The pseudo-first-order kinetic model best fits the experimental data while the adsorption mechanism appears to be surface adsorption as well as intraparticle diffusion. Equilibrium data follows Freundlich isotherm. The breakthrough studies yield decreased volume of treated water at the breakthrough. The BDST analysis yields errors of 1.1-27.6% between the predicted and experimental service times. (c) 2009 Elsevier B,V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Mechanism, Analysis, Aqueous-Solution, Bdst, Breakthrough, Breakthrough Studies, Carbon, Data, Defluoridation, Diffusion, Drinking Water, Drinking-Water, Equilibrium, Errors, Experimental, Fluoride, Freundlich, Freundlich Isotherm, Groundwater, Intraparticle Diffusion, Iron, Iron Removal, Isotherm, Kinetic, Kinetic Model, Kinetics, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Mechanism, Model, Potable Water, Pseudo First Order, Pseudo-First-Order, Removal, Rights, Rural, Rural Communities, Rural Water Supply, Sea Nodule, Service, Sorption, Source, Surface, Uptake, Volume, Water, Wooden Charcoal, Work

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Full Text: [2010\Desalination251, 146.pdf](2010/Desalination251,%20146.pdf)

Abstract: Polymeric waste, which is the main waste from textural industry in Turkey, was used as the raw material for the preparation of activated carbon by chemical activation with KOH. The pore properties, such as BET surface area, pore volume, pore-size distribution, and pore diameter, of the activated carbon were characterized by the t-plot based on the N-2-adsorption isotherm. The BET surface area of activated carbon (SK) was determined as 2390 m2/g. Activated carbon has been used for the removal of tannic acid from aqueous solutions. Adsorption experiments were carried out as a function of initial tannic acid concentration, contact time, and pH. Adsorption data were modeled using the Langmuir and Freundlich adsorption isotherms. The kinetic studies showed that the adsorption followed a pseudo second-order reaction. The intraparticle diffusion rate constant, external mass transfer coefficient, film and pore diffusion coefficients at various temperatures were evaluated. The thermodynamic parameters, such as ΔG°, ΔS°, and ΔH°, were calculated. The thermodynamics of tannic acid-SK system indicates endothermic process. (c) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activation, Adsorption, Adsorption Isotherms, Aqueous Solutions, Aqueous-Solutions, BET, BET Surface Area, Bottom Ash, Carbon, Chemical, Chemical Activation, Concentration, Data, De-Oiled Soya, Diffusion, Diffusion Coefficients, Distribution, Endothermic, Environmental, Equilibrium, Experiments, Freundlich, Function, Intraparticle Diffusion, Isotherm, Isotherms, Kinetic, Kinetic Studies, KOH, Langmuir, Malachite Green, Mass Transfer, Mass Transfer Coefficient, Methylene-Blue, pH, Physicochemical Properties, Polymeric Waste, Pore Diffusion, Pore Volume, Preparation, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Rate Constant, Recovery, Removal, Rights, Second Order, Second-Order, Solutions, Sorption, Surface, Surface Area, Tannic Acid, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Transfer Coefficient, Turkey, Volume, Waste, Waste-Water

? Senturk, H.B., Ozdes, D. and Duran, C. (2010), Biosorption of Rhodamine 6G from aqueous solutions onto almond shell (*Prunus dulcis*) as a low cost biosorbent. *Desalination*, **252** (1-3), 81-87.

Full Text: [2010\Desalination252, 81.pdf](2010/Desalination252,%2081.pdf)

Abstract: This work presents an alternative methodology for removal of a dyestuff, Rhodamine 6G (R6G), from aqueous solutions by using a new biosorbent, almond shell (*Prunus dulcis*), in a batch biosorption technique. The characterization of the biosorbent was performed by using FTIR and SEM techniques. The biosorption characteristics of R6G onto almond shell (AS) was investigated with respect to the changes in initial pH of dye solutions, contact time, initial R6G concentration, AS concentration, temperature etc. The influences of ionic strength on the biosorption process were also investigated. The biosorption kinetics was followed by pseudo-second-order model for all investigated initial R6G concentrations. Experimental data showed a good fit with both the Langmuir and Freundlich isotherm models. The monolayer biosorption capacity of AS was found to be 32.6 mg g-1 by using Langmuir model equations. Thermodynamic parameters including the Gibbs free energy (Δ*G*º), enthalpy (Δ*H*º), and entropy (Δ*S*º) changes indicated that the biosorption of R6G onto AS was feasible, spontaneous and endothermic in the temperature range of 0-40ºC. Crown Copyright (C) 2009 Published by Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption-Kinetics, Agricultural Waste Material, Almond Shell, Alternative, Aqueous Solutions, Basic Dye, Batch, Biosorbent, Biosorption, Biosorption Characteristics, Biosorption Kinetics, Capacity, Changes, Characteristics, Characterization, Concentration, Cost, Data, Dye, Dyestuff, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium, Freundlich, Freundlich Isotherm, FTIR, Gibbs Free Energy, Ionic Strength, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Model, Low Cost, Malachite Green, Mar, Methodology, Methylene-Blue, Model, Models, Monolayer, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Range, Removal, Rhodamine 6G, Rights, SEM, Solutions, Sorption, Strength, Techniques, Temperature, Thermodynamic, Thermodynamic Parameters, Time, Water, Work

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Full Text: [2010\Desalination252, 88.pdf](2010/Desalination252,%2088.pdf)

Abstract: The adsorption behavior of crystal violet (CV+) from aqueous solution onto a manganese oxide-coated (MCS) sepiolite sample was investigated as a function of parameters such as initial CV+ concentration, contact time and temperature. The Langmuir and Freundlich adsorption models were applied to describe the equilibrium isotherms. The Langmuir monolayer adsorption capacity of MCS was estimated as 319 mg/g. The pseudo-first-order. pseudo-second-order kinetic and the intraparticle diffusion models were used to describe the kinetic data and rate constants were evaluated. The values of the energy (E-a), enthalpy (Δ*H*-not equal) and entropy of activation (Δ*S*-not equal) were 56.45 kJ/mol, 53.90 kJ/mol and - 117.26J/(mol K), respectively, at pH 6.5. The quite high adsorption capacity and high adsorption rate of MCS will provide an important advantage for use of this material in basic dye solutions. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activation, Adsorption, Adsorption Behavior, Adsorption Capacity, Adsorption Rate, Aqueous Solution, Aqueous Solutions, Basic Dye, Behavior, Capacity, Cationic Dye, Clay, Concentration, Crystal Violet, Data, Diffusion, Dye, Dye Adsorption, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Isotherms, Fly-Ash, Freundlich, Function, Intraparticle Diffusion, Isotherms, Kinetic, Kinetics, Kinetics and Thermodynamics, Langmuir, Malachite Green, Manganese, Manganese Oxide Coated, MAR, MCS, Methylene-Blue, Models, Modified, Modified Diatomite, Monolayer, Oxide-Coated Sand, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Constants, Removal, Rights, Sepiolite, Solution, Solutions, Temperature, Thermodynamics, Time, Waste Apricot, X-Ray Diffraction

? Chen, S.H., Zhang, J., Zhang, C.L., Yue, Q.Y., Li, Y. and Li, C. (2010), Equilibrium and kinetic studies of methyl orange and methyl violet adsorption on activated carbon derived from *Phragmites australis*. *Desalination*, **252** (1-3), 149-156.

Full Text: [2010\Desalination252, 149.pdf](2010/Desalination252,%20149.pdf)

Abstract: The adsorption of methyl orange and methyl violet from aqueous solutions by Phragmites australis activated carbon (PAAC) was studied in a batch adsorption system. The adsorption studies include both equilibrium adsorption isotherms and kinetics. Several isotherm models were investigated and the adsorption isotherm data were best represented by the Temkin isotherms. The kinetic data were well described by the pseudo-second-order kinetic model. The mechanism of the adsorption process was determined from the intraparticle diffusion model. The results indicate that PAAC could be employed as a low-cost alternative for the removal of the textile dyes from effluents. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Isotherms, Alternative, Aqueous Solutions, Aqueous-Solution, Batch, Batch Adsorption, Blue, Carbon, Coconut Husk, Data, Diffusion, Diffusion Model, Dye, Dyes, Effluents, Equilibrium, Equilibrium Isotherm, Fly-Ash, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Low Cost, Mar, Mechanism, Methyl Orange, Methyl Violet, Model, Models, Phragmites Australis Activated Carbon, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Solutions, Sorption, Waste, Wood Sawdust

? Rahmani, A., Mousavi, H.Z. and Fazli, M. (2010), Effect of nanostructure alumina on adsorption of heavy metals. *Desalination*, **253** (1-3), 94-100.

Full Text: [2010\Desalination253, 94.pdf](2010/Desalination253,%2094.pdf)

Abstract: This paper describes the adsorption of heavy metal ions from aqueous solutions by nano structure alumina. Our study tested the removal of three heavy metals: Pb2+, Ni2+ and Zn2+. The optimum contact time, adsorbent mass, and pH were determined, and adsorption isotherms were obtained using concentrations of the metal ions ranging from 25 to 150 mg L−1. The adsorption process follows pseudo-second-order reaction kinetics, as well as Langmuir and Freundlich adsorption isotherms. The paper discusses the thermodynamic parameters of the adsorption (the Gibbs free energy, entropy, and enthalpy). Our results demonstrate that the adsorption process was spontaneous and exothermic under natural conditions. The maximum capacity of adsorbent for Pb2+, Ni2+ and Zn2+ are 125, 83.33 and 58.82 mg g−1, respectively. This study revealed that nano structure γ-alumina was an effective adsorbent for removal of these ions from aqueous solutions.

Keywords: Acid-Mine Drainage, Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherms, Alumina, Aqueous Solutions, Aqueous-Solutions, Capacity, Copper(II), Energy, Enthalpy, Entropy, Equilibrium, Exothermic, Fly-Ash, Freundlich, Gamma-Alumina, Gibbs Free Energy, Heavy Metal, Heavy Metal Ions, Heavy Metals, Ions, Isotherm, Isotherms, Kinetic, Kinetics, L1, Langmuir, Low-Cost, Metal, Metal Ions, Metals, Nano Structured Alumina, Nano-Structure, Natural, Ni2+, Pb2+, pH, Pseudo Second Order, Pseudo-Second-Order, Reaction, Reaction Kinetics, Removal, Rights, Solutions, Structure, Thermodynamic, Thermodynamic Parameters, Time, Waste-Water, Zn2+

? Rahmani, A., Mousavi, H.Z. and Fazli, M. (2010), Adsorption of basic dyes on activated carbon prepared from *Polygonum orientale* Linn: Equilibrium, kinetic and thermodynamic studies. *Desalination*, **254** (1-3), 68-74.

Full Text: [2010\Desalination254, 68.pdf](2010/Desalination254,%2068.pdf)

Abstract: Low cost activated carbon was prepared from Polygonum orientale Linn by phosphoric acid activation. Its ability to remove the basic dyes, malachite green (MG) and rhodamine B (RB) was evaluated. The surface area of P. orientale Linn activated carbon (PLAC) was found to be 1398 m2/g. The effects of experimental parameters such as initial concentration, contact time, pH, ionic strength and temperature on the adsorption were investigated. Alkaline pH was more favorable for MG adsorption, whereas acidic pH was better for RB uptake. Adsorption of dyes on PLAC was weakly dependent on ionic strength. The adsorption kinetics was found to be best represented by the pseudo-second-order kinetic model. The mechanism of the adsorption process was determined from the intraparticle diffusion model. The equilibrium adsorption data was well described by the Langmuir model. Thermodynamic study showed that the adsorption was a spontaneous, endothermic process.

Keywords: Acid Activation, Acid-Activation, Activated Carbon, Activation, Adsorption, Adsorption Kinetics, Aqueous-Solutions, Basic Dyes, Carbon, Coir Pith, Concentration, Cost, Crystal Violet, Data, Diffusion, Diffusion Model, Dyes, Endothermic, Equilibrium, Experimental, Fly-Ash, Intraparticle Diffusion, Intraparticle Diffusion Model, Ionic Strength, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Model, Liquid-Phase Adsorption, Malachite Green, Malachite Green-Dye, Mechanism, Methylene-Blue, Mg, Model, P, pH, Phosphoric Acid, Polygonum Orientale Linn Activated Carbon, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Rhodamine B, Rhodamine-B, Rights, Solid-Waste, Strength, Surface, Surface Area, Temperature, Thermodynamic, Thermodynamic Studies, Thermodynamic Study, Time, Uptake, Waste-Water

? Bashir, M.J.K., Aziz, H.A., Yusoff, M.S. and Adlan, M.N. (2010), Application of response surface methodology (RSM) for optimization of ammoniacal nitrogen removal from semi-aerobic landfill leachate using ion exchange resin. *Desalination*, **254** (1-3), 154-161.

Full Text: [2010\Desalination254, 154.pdf](2010/Desalination254,%20154.pdf)

Abstract: Disposal of untreated landfill leachate can be a source of hazard to receiving waters. Hence, treatment of landfill leachate is considered environmentally essential. In this study, optimization of ammoniacal nitrogen (NH3-N) removal from Malaysian semi-aerobic landfill stabilized leachate using synthetic cation ion exchange resin was investigated. An ideal experimental design was carried out based on Central Composite Design (CCD) with response surface methodology (RSM). This RSM was used to evaluate the effects of process variables and their interaction towards the attainment of their optimum conditions. Equilibrium isotherms in this study were analyzed using the Langmuir and Freundlich. Kinetic data were obtained and analyzed using pseudo-first-order and pseudo-second-order equations. Based on statistical analysis, the NH3-N removal model proved to be highly significant with very low probability values (<0.0001). The optimum conditions obtained were 24.6 cm3 resin dosage, 6.00 min contact time, and 147.0 rpm shaking speed. This resulted in 94.2% removal of NH3-N as obtained from the predicted model, which fitted well with the laboratory results (i.e., 92%). The adsorption isotherm data were fitted well to the Langmuir isotherm, and the monolayer adsorption capacity was found as 12.56 mg/g. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Activated-Sludge, Adsorption, Adsorption Capacity, Adsorption Isotherm, Analysis, Aqueous-Solutions, Capacity, Cation, Coagulation, Composite, Data, Denitrification, Design, Disposal, Dye, Equilibrium, Equilibrium Isotherms, Experiences, Experimental, Experimental Design, Freundlich, Hazard, Interaction, Ion Exchange, Ion Exchange Resin, Ion-Exchange, Isotherm, Isotherms, Kinetic, Kinetics, Landfill, Landfill Leachate, Langmuir, Langmuir Isotherm, Leachate, Methodology, Model, Monolayer, NH3-N, Nitrification, Nitrogen, Nitrogen Removal, Optimization, Organic-Matter, Pretreatment, Process Optimization, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Receiving Waters, Removal, Resin, Response Surface Methodology, Response Surface Methodology (RSM), Rights, RSM, Source, Stabilized Leachate, Statistical Analysis, Surface, Time, Treatment, Waste-Water, Waters

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Full Text: [2010\Desalination-Ho.pdf](2010/Desalination-Ho.pdf); [2010\Desalination-Ho1.pdf](2010/Desalination-Ho1.pdf); [2010\Desalination257, 93.pdf](2010/Desalination257,%2093.pdf)

Abstract: Simulated pseudo-second-order kinetic adsorption data were analyzed by different methods of least-squares regression. The methods used were non-linear regression and four linearized forms of the pseudo-second-order equation. The simulated data were compromised with three different homoskedastic and heteroskedastic error distributions. In the presence of all types of error distributions, non-linear regression was the most robust method and provided accurate and efficient estimates of the kinetic parameters.

Keywords: Pseudo-Second-Order, Adsorption Kinetics, Non-Linear Regression, Least Squares

? Abd El-Latif, M.M. and Elkady, M.F. (2010), Equilibrium isotherms for harmful ions sorption using nano zirconium vanadate ion exchanger. *Desalination*, **255** (1-3), 21-43.

Full Text: [2010\Desalination255, 21.pdf](2010/Desalination255,%2021.pdf)

Abstract: Harmful ions such as cesium, cobalt and nickel were removed from aqueous solutions using nano zirconium vanadate ion exchangers that prepared using three different techniques and their organic hybrids. Different processing parameters that affect on sorption efficiency were studied. All prepared ion exchangers and their composites have high uptake affinity for cesium removal. The removal capacities of the ion exchangers either the inorganic ones or those that immobilized decreased in the acidic media, in contrast to the alkaline that enhances the ion exchange process. Both the temperature and agitation were found to be appropriate for maximum ions removal. The sorption data obtained for equilibrium conditions have been analyzed using the linear forms of Freundlich, Langmuir and Dubinin-Radushkevich isotherms and the applicability of these isotherm equations to the sorption systems was compared by judging the correlation coefficients, R-2. It was established that the equilibrium isotherms models’ applicability follows the order: Langmuir>Freundlich>Dubinin-Radushkevich, in case of cesium removal using the different prepared inorganic ion exchangers. But the applicability for cobalt and nickel ions removal using the different prepared inorganic ion exchangers follows the order Freundlich>Langmuir>Dubinin-Radushkevich. The sorption processes for ions uptake using the different types of the prepared inorganic ion exchangers were found to be endothermic processes. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Agitation, Aqueous Solutions, Aqueous-Solutions, Cesium, Cobalt, Composites, Correlation, Data, Efficiency, Endothermic, Equilibrium, Equilibrium Isotherms, Forms, Freundlich, Heavy-Metal Ions, Immobilized, Ion Exchange, Ion Exchangers, Ion-Exchange, Ions, Isotherm, Isotherm Equations, Isotherms, Langmuir, Media, Models, Nickel, Nickel, Organic, Powder, Preconcentration, Purification, Removal, Rights, Solutions, Sorbent, Sorption, Sorption Isotherm, Systems, Techniques, Temperature, Uptake, Zirconium Vanadate

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Full Text: [2010\Desalination255, 44.pdf](2010/Desalination255,%2044.pdf)

Abstract: Hydrated iron(III)-aluminum(III)-chromium(III) ternary mixed oxide (HIACMO) was synthesized and characterized. FTIR studies confirmed the presence of M-O-M-1 type bond in HIACMO. Use of it for investigating fluoride removal efficiency at varied conditions showed that the reaction was pH sensitive, and optimum pH (initial) was between 4.0 and 7.0. The time required to attain dynamic equilibrium was 1.5 h. The pseudo-second order equation described all kinetic data very well. The rate of reaction was multistage diffusion phenomena. The Langmuir isotherm equation described the equilibrium well. Thermodynamic analyzes of equilibriums indicated that the adsorption reaction of fluoride with HIACMO from water was endothermic and spontaneous in nature. The equilibrium solution pH analyzes suggested ion/ligand exchange mechanism for fluoride adsorption. Regeneration of fluoride adsorbed material could be possible up to 90.0 (±2.0)% with 0.5 M NaOH. 0.2 g of HIACMO reduced fluoride level well below the maximum permissible value from 50.0 ml of fluoride spiked tap water (10.0 mg F- dm-3) sample. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Alumina, Adsorption, Adsorption-Kinetics, Aqueous Solution, Carboxylated Chitosan Beads, Concrete Materials, Data, Diffusion, Donnan Dialysis, Drinking-Water, Dynamic, Efficiency, Endothermic, Equilibrium, Fixed-Bed, Fluoride, Fluoride Adsorption, Fluoride Removal, Fluoride Removal Efficiency, FTIR, FTIR Studies, Iron(III)-Aluminum(III)-Chromium(III) Mixed Oxide, Isotherm, Kinetic, Langmuir, Langmuir Isotherm, Low-Cost Materials, Mechanism, NaOH, Oxide, pH, pH-Sensitive, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Reaction, Regeneration, Removal, Removal Efficiency, Rights, Solution, Sorption, Thermodynamic, Time, Value, Water

? Zhang, R.H., Wang, B. and Ma, H.Z. (2010), Studies on chromium(VI) adsorption on sulfonated lignite. *Desalination*, **255** (1-3), 61-66.

Full Text: [2010\Desalination255, 61.pdf](2010/Desalination255,%2061.pdf)

Abstract: Sulfonated lignite was prepared in order to study the adsorption behavior and the removal of Cr(VI) ions from aqueous solutions as a function of contact time, initial pH, using batch technique. Adsorption data of Cr(VI) on the sulfonated lignite were analyzed according to Langmuir Freundlich and Temkin adsorption models. Thermodynamic parameters for the adsorption system were determinated at 293 K, 303 K and 313K. (ΔHº = 14.16 kJ mol-1; ΔGº = 4.43 to -5.71 kJ mol-1 and ΔS = 63.42 J K-1 mol-1). The numerical values obtained showed that Cr(VI) adsorption is a spontaneous, entropy-driven and endothermic process. The process kinetics was evaluated by pseudo-first, pseudo-second order and Elovich kinetic models. Elovich kinetic model exhibited the highest correlation with data. These results show that the sulfonated lignite could be considered as a potential adsorbent for chromium ions in aqueous solutions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Adsorbent, Adsorption, Adsorption Behavior, Aqueous Solutions, Aqueous-Solution, Batch, Behavior, Chromium, Chromium(VI), Chromium Ions, Correlation, Data, Elovich, Endothermic, Freundlich, Function, Heavy-Metals, Hexavalent Chromium, Industrial-Waste-Water, Ions, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Langmuir-Freundlich, Low-Cost Adsorbents, Model, Models, pH, Potential, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Solutions, Sorption, Sulfonated Lignite, Temkin, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Time, VI

? Suteu, D., Malutan, T. and Bilba, D. (2010), Removal of reactive dye Brilliant Red HE-3B from aqueous solutions by industrial lignin: Equilibrium and kinetics modeling. *Desalination*, **255** (1-3), 84-90.

Full Text: [2010\Desalination255, 84.pdf](2010/Desalination255,%2084.pdf)

Abstract: The lignin, one of the main by-products of the pulp industry, can be used to remove dyes from textile wastewaters. The potential of the lignin for Brilliant Red HE-3B reactive dye removal from aqueous solutions at pH = 1.5 was examined by the batch technique as a function of dye concentration, solution temperature and contact time. The Freundlich, Langmuir, Dubinin-Radushkevich and Tempkin adsorption isotherms were used to describe the data of sorption equilibrium and to determine its corresponding isotherm constants. The thermodynamic parameters Δ*G*, Δ*H* and Δ*S* were also determined; the obtained values show that the sorption of reactive dye on lignin is a spontaneous, endothermic and entropy-driven process. The kinetic of reactive dye sorption was analyzed using the pseudo-first order and pseudo-second order kinetic models; the kinetic data fitted well to the pseudo-second order kinetics, indicating the chemisorption of reactive dye onto lignin. The reactive dye sorption onto lignin was mainly conducted through the ion exchange mechanism, confirmed by FTIR spectroscopy. The results evidenced that the lignin has a viable or real potential to remove the Brilliant Red HE-3B reactive dye from aqueous effluents. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Aqueous Solutions, Batch, Biosorbent, Biosorption, Cadmium, Chemisorption, Concentration, Copper, Data, Dye, Dye Removal, Dyes, Effluents, Endothermic, Equilibrium, Freundlich, FTIR, FTIR Spectra, FTIR Spectroscopy, Function, Heavy-Metals, Ion Exchange, Ion-Exchange, Ions, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetic Study, Kinetics, Langmuir, Lignin, Mechanism, Modeling, Models, pH, Potential, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First Order, Pseudo-First Order and Pseudo-Second Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Reactive Dye, Removal, Rights, Single, Solution, Solutions, Sorption, Sorption Isotherms, Spectroscopy, Temperature, Thermodynamic, Thermodynamic Parameters, Time, Wastewaters

? Ertugay, N. and Bayhan, Y.K. (2010), The removal of copper(II) ion by using mushroom biomass (*Agaricus bisporus*) and kinetic modelling. *Desalination*, **255** (1-3), 137-142.

Full Text: [2010\Desalination255, 137.pdf](2010/Desalination255,%20137.pdf)

Abstract: The efficiency of Agericus bisporus as an adsorbent for removing Cu2+ ions from synthetic wastewater has been studied. Batch adsorption experiments were carried out as a function of contact time, pH, zeta potential of particles, initial metal ion concentration and temperatures. Cu2+ uptake was very rapid during the first 5 min. Contact time was observed in 30 min. The extent of metal ion removed increased with increasing initial metal ion concentration. Maximum metal sorption was found to occur at initial pH 5.0. Adsorption equilibrium data was calculated for Langmuir, Freundlich, Dubinin-Radushkevich and Temkin isotherms at different temperatures. It was found that biosorption of Cu2+ was better suited to the Freundlich adsorption model than other adsorption models. To study the kinetics of adsorption, batch adsorption models were applied, using pseudo-first and second-order mechanisms at different initial concentrations of Cu2+. The best result came from the second-order mechanism. Thermodynamic parameters such as Δ*G*º, Δ*H*º and Δ*S*º were calculated. The thermodynamics of Cu2+ ion onto A. bisporus indicates the spontaneous and exothermic nature of the process. The activation energy of the biosorption (E-a) was determined as 118.86 kJ mol-1 from the Arrhenius equation. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activation, Activation Energy, Adsorbent, Adsorption, Adsorption Equilibrium, Adsorption Isotherms, Agaricus Bisporus, Aqueous-Solutions, Batch, Batch Adsorption, Biomass, Biosorption, Biosorption, Concentration, Copper, Copper(II), Cr(VI), Cu(II) Ions, Cu2+, Data, Efficiency, Energy, Equilibrium, Exothermic, Experiments, First, Freundlich, Function, Ions, Isotherms, Kinetic, Kinetic Modelling, Kinetics, Kinetics of Adsorption, Langmuir, Low-Cost Adsorbents, Mechanism, Mechanisms, Metal, Metal Ion, Metal Sorption, Model, Modelling, Models, N, Particles, pH, Potential, Pseudo-First and, Removal, Rights, Second Order, Second-Order, Sorption, Temkin, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Time, Uptake, Waste-Water, Wastewater, Zeta Potential

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Full Text: [2010\Desalination255, 159.pdf](2010/Desalination255,%20159.pdf)

Abstract: The potential feasibility of activated carbon derived from oil palm empty fruit bunch (EFB) for the removal of 2,4-dichlorophenol (2,4-DCP) from aqueous solution was studied. The activated carbon was prepared via chemical activation with phosphoric acid. The effect of contact time, initial concentration (25-250 mg/L), temperature (30-50º C) and pH (2-12) were investigated. The experimental data were analyzed by the Langmuir and Freundlich isotherm models. The equilibrium data were best represented by Langmuir isotherm model, with a maximum monolayer adsorption capacity of 232.56 mg/g at 30ºC. The adsorption kinetics was well described by the pseudo-second-order kinetic model. The empty fruit bunch based activated carbon (EFBAC) was shown to be a promising material for adsorption of 2,4-DCP from aqueous solutions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 2,4,6-Trichlorophenol, 2,4-Dcp, 2,4-Dichlorophenol, Activated Carbon, Activation, Adsorption, Adsorption Capacity, Adsorption Kinetics, Agricultural, Agricultural Waste, Aqueous Solution, Aqueous Solutions, Aqueous-Solutions, Basic Dye, Batch Adsorption, Capacity, Carbon, Chemical, Chemical Activation, Concentration, Data, Dye Adsorption, Empty-Fruit Bunches, Equilibrium, Experimental, Feasibility, Freundlich, Freundlich Isotherm, Isotherm, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Model, Models, Monolayer, Oil Palm Empty Fruit Bunch, pH, Phosphoric Acid, Pith Carbon, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Solution, Solutions, Temperature, Time, Waste

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Full Text: [2010\Desalination255, 165.pdf](2010/Desalination255,%20165.pdf)

Abstract: Raw rubber wood (*Hevea brasiliensis*) saw dust (RSD) was modified using phosphoric acid and sodium hydroxide with different impregnation ratios (IR) to improve adsorption capacity for the removal of copper from aqueous solutions. The modified saw dusts using phosphoric acid (PMSD4, IR 1:2) and sodium hydroxide (SMSD3, IR 1:1) were evaluated through SEM and FTIR. Equilibrium and kinetic adsorption studies were carried using RSD, PMSD4 and SMSD3. The effects of various operating variables such as solution pH, adsorbent dose, initial copper concentration, temperature on the removal of copper ions have been studied. The copper adsorption data were fitted to various isotherm models. The data were also fitted to kinetic models such as pseudo first order, pseudo second order, Elovich and intraparticle diffusion models. The optimum pH for the adsorption was 6. The adsorption data were found to follow the Langmuir and Freundlich models better than the other models. The adsorption of the metal ions increased with increasing temperature indicating the endothermic nature of the adsorption process. Thermodynamic parameters such as free energy, enthalpy and entropy change were calculated. An appreciable increase in adsorption capacity was observed when studies were carried out using SMSD3 to PMSD4 and RSD. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Adsorption Capacity, Aqueous Solution, Aqueous Solutions, Capacity, Coir Pith, Concentration, Copper, Copper Adsorption, Copper Ions, Data, Diffusion, Dust, Elovich, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Isotherm, First, First Order, Freundlich, FTIR, Heavy-Metals, Impregnation, Intraparticle Diffusion, Ions, IR, Isotherm, Isotherms, Kinetic, Kinetic Adsorption, Kinetic Models, Kinetics, Kinetics, Langmuir, Metal, Metal Ions, Models, Modified, Natural Adsorbents, pH, Phosphoric Acid, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Rights, Saw Dust, Sawdust, Second Order, Second-Order, SEM, Sodium, Solution, Solutions, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Waste-Water, Wood

? Durmaz, F. and Kara, H. (2010), alpha-novel determination method of Cu(II) ions on the immobilized humic acid by SPE-FIA hyphenated technique. *Desalination*, **256** (1-3), 1-8.

Full Text: [2010\Desalination256, 1.pdf](2010/Desalination256,%201.pdf)

Abstract: The aim of this study was to optimize the integrated SPE-FIA (Solid phase extraction-flow-injection analysis) hyphenated technique for determination of trace level of Cu(II) ions where flow-injection sample processing was used. Firstly, Humic acid (HA) was immobilized onto aminopropyl silica (APS). Then, the material was filled into the column using slurry packing procedure. The prepared column was assembled to HPLC using two valves system for SPE-FIA analysis and used for the removal of Cu(II) ions from aqueous solution. The analysis of Cu(II) ions was realized by both SPE and FIA techniques on modified HPLC system as online. In SPE system, Cu(II) ions were preconcentrated on micro column loaded with immobilized humic acid (ImHA). EDTA (pH = 8) solution was used for the elution of Cu(II) ions sorbed by ImHA. The sorption characteristics of Cu(II)-immobilized humic acid system were investigated at different Cu(II) concentrations, and output was observed by a UV detector. The developed method was applied for online metal ion determination in samples, especially Cu(II) and obtained results compared with atomic absorption spectrophotometer (AAS) results. Sorption characteristics were evaluated by using Freundlich, Langmuir, and Dubinin-Radushkevich (D-R) adsorption isotherms, as well as by Scatchard plot analysis. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Absorption, Adsorption, Adsorption Isotherms, Analysis, Aqueous Solution, Aqueous-Solution, Characteristics, Column, Column Arrangement, Copper, Cu, Cu(II), Cu(II) Ions, EDTA, Elution, FIA, Flow-Injection Analysis, Flow-Injection Analysis, Freundlich, Heavy-Metals, HPLC, Humic Acid, Immobilized, Immobilized Humic Acid, Ions, Isotherms, Langmuir, Lead, Metal, Metal Ion, Modified, pH, Procedure, Removal, Rights, Silica, Silica-Gel, Solid Phase Extraction, Solid-Phase Extraction, Solution, Sorption, Techniques, UV, Water Samples

? Chakravarty, P., Sen Sarma, N. and Sarma, H.P. (2010), Removal of lead(II) from aqueous solution using heartwood of *Areca catechu* powder. *Desalination*, **256** (1-3), 16-21.

Full Text: [2010\Desalination256, 16.pdf](2010/Desalination256,%2016.pdf)

Abstract: Removal of lead(II) from aqueous solution was studied using the powder of heartwood of Areca catechu as a new biosorbent under batch method at room temperature. Various sorption parameters such as contact time, initial concentration of lead(II) ion, effect of pH and amount of the biomass on the adsorption capacity of the biosorbent were studied. The adsorbent was effective for the quantitative removal of lead(II) ions in acidic conditions and equilibrium has been achieved in 25 min. The equilibrium adsorption data were fitted to Langmuir and Freundlich adsorption isotherm models and the model parameters were evaluated. The kinetic study showed that the pseudo-second order rate equation better described the biosorption process. The FT-IR spectra of the adsorbent before and after treatment with lead(II) solution indicated that hydroxyl, carboxyl, amide and amine groups were major binding sites with the metal. This method is quite feasible, economic, time saving, and low cost. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherm Models, Aqueous Solution, Areca Catechu Powder, Batch, Batch Method, Binding, Binding Sites, Biomass, Biosorbent, Biosorption, Capacity, Cd(II), Concentration, Copper(II), Cost, Data, Economic, Equilibrium, Freundlich, Freundlich Adsorption Isotherm, FT-IR, FTIR, FTIR Spectra, Ions, Isotherm, Kinetic, Kinetic Study, Kinetics, Langmuir, Lead(II), Lead(II) Ion, Low Cost, Metal, Metal-Ions, Model, Models, Pb(II), pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Room Temperature, Solution, Sorption, Temperature, Treatment, Vulgaris, Wastewater

? Ciftci, H., Yalcin, H., Eren, E., Olcucu, A. and Sekerci, M. (2010), Enrichment and determination of Ni2+ ions in water samples with a diamino-4-(4-nitro-phenylazo)-1H-pyrazole (PDANP) by using FAAS. *Desalination*, **256** (1-3), 48-53.

Full Text: [2010\Desalination256, 48.pdf](2010/Desalination256,%2048.pdf)

Abstract: Nickel, as a heavy metal, is toxic for many living species. Thus, the determination of trace amounts of nickel in environmental samples is of great importance. In the present study, new, sensitive, simple and validated solid phase extraction method is developed for the determination of nickel. In recent study nickel was preconcentrated as diamino-4-(4-nitro-phenylazo)- 1H-pyrazole (PDANP) chelates (Ni-PDANP) from sample solutions using a column containing Amberlite XAD-7 and determined by flame atomic absorption spectrometry (FAAS). The optimum experimental parameters such as pH of the medium, sample flow rate, eluent and effect of matrix ions on the method efficiency were investigated. The optimum pH value for quantitative sorption of Ni-PDANP was found between 6.0 and 8.0. Elution process was performed by using 6 mL of 2 mol L-1 HCl. The sorption capacity of resin was determined to be 7.2 mg g(-1) for Ni. The preconcentration factor was 125. In optimized conditions. A relative standard deviation and detection limit were found to be 2.8% and 0.44 mu g L-1 respectively. The method was successfully applied to determine the trace amounts of nickel in tap water and mineral waters, and suitable recoveries were obtained (100.0-103.5%). (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Absorption, Amberlite XAD-7, Atomic Absorption Spectrometry, Atomic-Absorption-Spectrometry, Capacity, Carcinogenesis, Chelates, Cobalt, Column, Efficiency, Elements, Elution, Enrichment, Environmental, Experimental, Extraction, FAAS, Flow, Flow Rate, Heavy Metal, Ions, L1, Living, Matrix, Metal, Ni2+, Nickel, Nickel, Optimization, Pdanp, pH, pH Value, Preconcentration, Preconcentration, Recent, Removal, Resin, Rights, Solid Phase Extraction, Solid-Phase Extraction, Solutions, Sorption, Sorption Capacity, Species, Spectrometry, Standard, Toxic, Value, Water, Water Samples, Waters

? Sohrabnezhad, S. and Pourahmad, A. (2010), Comparison absorption of new methylene blue dye in zeolite and nanocrystal zeolite. *Desalination*, **256** (1-3), 84-89.

Full Text: [2010\Desalination256, 84.pdf](2010/Desalination256,%2084.pdf)

Abstract: Mordenite and mordenite nanocrystal, were employed as effective adsorbents for new methylene blue (NMB) from an aqueous solution. The adsorption kinetics was investigated. The adsorption capacity of mordenite nanocrystal zeolite for NMB dye is more than that of the mordenite zeolite. Kinetic and adsorption isotherm studies demonstrate that the adsorption follows the pseudo second-order kinetics. The intraparticle diffusion rate coefficient values at 25ºC obtained by using the Morris-Weber equation showed that new methylene blue reached equilibrium in mordenite nanocrystal faster than in mordenite adsorbent. The effects of equilibrium time, solution pH and sorption temperature were examined. Solution pH will affect the adsorption behavior of mordenite and mordenite nanocrystal. Higher solution pH results in higher adsorption capacity. The results show that adsorption capacity dye increases in lower temperature. (C) 2010 Elsevier BM. All rights reserved.

Keywords: Absorption, Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Behavior, Adsorption Capacity, Adsorption Isotherm, Adsorption Kinetics, Aqueous Solution, Basic-Dyes, Behavior, Capacity, Clinoptilolite, Diffusion, Dye, Dye Removal, Equilibrium, Intraparticle Diffusion, Isotherm, Kinetic, Kinetics, Methylene Blue, Mordenite, Mordenite Nanocrystal, Morris-Weber Equation, Nanocrystal, Natural Zeolite, New Methylene Blue, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo Second-Order, Pseudo-Second-Order, Reactive Dyes, Removal, Rights, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Solution, Solution pH, Sorption, Temperature, Waste-Water Treatment, X-Ray Diffraction, Zeolite

? Salman, J.M. and Hameed, B.H. (2010), Adsorption of 2,4-dichlorophenoxyacetic acid and carbofuran pesticides onto granular activated carbon. *Desalination*, **256** (1-3), 129-135.

Full Text: [2010\Desalination256, 129.pdf](2010/Desalination256,%20129.pdf)

Abstract: Adsorption equilibrium and kinetics of 2,4-dichlorophenoxyacetic acid (2,4-D) and carbofuran using commercial granular activated carbon, Filtersorb 300 (GAC F300) were studied in a batch system with respect to initial concentration of 2,4-D and carbofuran. The Langmuir and the Freundlich isotherm models were applied to the equilibrium data of 2,4-D and carbofuran adsorption. Observed results showed that the equilibrium data fitted well to the Langmuir equilibrium model in the studied concentration range of 2,4-D and carbofuran. The monolayer adsorption capacities of GAC F300 were 181.82 and 96.15 mg/g for 2,4-D and carbofuran, respectively. Two simplified models, pseudo-first order and pseudo-second order kinetic, were used to test the adsorption kinetics of 2, 4-D and carbofuran on GAC F300. The data was best fitted to the pseudo-second-order kinetic model. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 2,4-D, 2,4-Dichlorophenoxyacetic Acid, Activated Carbon, Adsorption, Adsorption Capacities, Adsorption Equilibrium, Adsorption Kinetics, Aqueous-Solution, Batch, Batch System, Carbofuran, Carbon, Concentration, Data, Degradation, Equilibrium, Equilibrium, Equilibrium Model, Freundlich, Freundlich Isotherm, GAC, Granular Activated Carbon, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Kinetics, Langmuir, Model, Models, Monolayer, Pesticides, 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, Pseudo-Second-Order Kinetic Model, Rights, Samples, Sorption

? Wu, X.M., Wang, Y.L., Xu, L.L. and Lv, L. (2010), Removal of perchlorate contaminants by calcined Zn/Al layered double hydroxides: Equilibrium, kinetics, and column studies. *Desalination*, **256** (1-3), 136-140.

Full Text: [2010\Desalination256, 136.pdf](2010/Desalination256,%20136.pdf)

Abstract: The adsorption properties of calcined layered double hydroxide (denoted as CLDH) for perchlorate (ClO4-) pollutant from aqueous solution were examined in batch and column model. The influences of chemical composition of adsorbents. adsorbent dose, and co-existing anions on the perchlorate removal in batch model have been investigated. The maximum uptake capacity was obtained at a calcined temperature of 500 degrees C with Zn/Al ratio of 2. The Freundlich isotherm and Langmuir isotherm were used to fit the data of equilibrium experiments. The removal of perchlorate ion is best represented by the Freundlich curve than that of the Langmuir. Free energy (Delta G(0) = -1.4 kJ/mol), calculated from Freundlich constants, indicated the spontaneity of the uptake process. The adsorption process was found to be endothermic and followed the modified multiplex kinetic model. The calculated values of E-a1 and E-a2 are 11.66 and 30.13 kJ/mol respectively, indicating that the rapid step of the uptake process is controlled by diffusion, and the slow step is controlled by the reaction of perchlorate with the CLDH rather than by diffusion. The effect of flow rate on the column behavior was also studied. Increasing the residence time in the column could enhance the sorption capacity of the bed and its efficiency. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption Properties, Anions, Aqueous Solution, Aqueous-Solutions, Batch, Behavior, Calcined, Capacity, Chemical, Chromium(Vi), Co-Existing Anions, Column, Column Behavior, Column Studies, Composition, Contaminants, Data, Diffusion, Double Hydroxide, Drinking-Water, Efficiency, Endothermic, Energy, Equilibrium, Experiments, Flow, Flow Rate, Freundlich, Freundlich Isotherm, Hydrotalcite, Ion, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Layered Double Hydroxide, Layered Double Hydroxides, Mg-Al-Co3 Hydrotalcite, Model, Modified, Perchlorate, Removal, Residence Time, Rights, Solution, Sorption, Sorption Capacity, Temperature, Uptake

? Karaoğlu, M.H., Doğan, M. and Alkan, M. (2010), Kinetic analysis of reactive blue 221 adsorption on kaolinite. *Desalination*, **256** (1-3), 154-165.

Full Text: [2010\Desalination256, 154.pdf](2010/Desalination256,%20154.pdf)

Abstract: The use of cheap, efficient and ecofriendly adsorbent has been studied as an alternative source of activated carbon for the removal of dyes from wastewater. This study has investigated the potential use of kaolinite as alternative adsorbent for the removal of reactive blue 221 from wastewater. Therefore, a series of kinetic experiments were conducted in a batch system to assess the effect of the system variables, i.e. stirring speed, contact time, initial dye concentration, initial pH. temperature and acid-activation. The adsorption rate increased with the increasing initial dye concentration, ionic strength, solution temperature and acid-activation, but decreased with an increase in pH. The stirring speed had no important effect on the adsorption rate. The rates of adsorption were found to conform to the pseudo-second-order kinetics with a good correlation. In addition, various thermodynamic activation parameters, such as Gibbs free energy, enthalpy, entropy and the activation energy were calculated. The adsorption process of reactive blue 221 on kaolinite was found to be not a spontaneous and endothermic process. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Activation, Acid-Activation, Activated Carbon, Activation, Activation Energy, Activation Parameters, Adsorbent, Adsorption, Adsorption Kinetics, Adsorption Rate, Alternative, Analysis, Aqueous-Solutions, Basic-Dyes, Batch, Batch System, Carbon, Cationic Dyes, Concentration, Correlation, Dye, Dyes, Electrokinetic Properties, Endothermic, Energy, Enthalpy, Entropy, Experiments, Fly-Ash, Gibbs Free Energy, Ionic Strength, Kaolinite, Kinetic, Kinetics, Mechanism, Methylene-Blue, pH, Potential, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Rates, Removal, Removal of Dyes, Rights, Sepiolite, Solution, Source, Strength, Temperature, Thermodynamic, Thermodynamic Activation Parameters, Wastewater

? Hamad, B.K., Noor, A.M., Afida, A.R. and Asri, M.N.M. (2010), High removal of 4-chloroguaiacol by high surface area of oil palm shell-activated carbon activated with NaOH from aqueous solution. *Desalination*, **257** (1-3), 1-7.

Full Text: [2010\Desalination257, 1.pdf](2010/Desalination257,%201.pdf)

Abstract: The adsorption of 4-chloroguaiacol (4CG) onto activated carbon prepared from the oil palm shell (OPSAC) was studied. The adsorbent was prepared from oil palm shell raw material impregnated in sodium hydroxide (NaOH) solution followed by the pyrolysis and activation process at 800ºC in N-2 and CO2 gas, separately. The effects of solution pH, agitation time, and initial concentration of 4CG were evaluated. 4CG adsorption uptake was found to increase with increase in contact time and initial concentration, while the high adsorption was obtained in an acidic medium at pH=2. The high Brunauer-Emmett-Teller (BET) surface area and the average pore diameter were equal to 2247 m(2)/g and 2.68 nm, respectively. The surface morphology and functional groups of the activated carbon were determined by using scanning electron microscopy and Fourier transform infrared analysis. The adsorption equilibrium data were analyzed by Langmuir, Freundlich, and Temkin isotherm models. Adsorption data of 4CG from the activated carbon were in agreement with Langmuir isotherm, with a maximum monolayer adsorption capacity of 454.45 mg/g. The applicability of two kinetic models, the pseudo-first-order and pseudo-second-order models, for describing the data was studied and the adsorption kinetics was found to follow the pseudo-second-order model. Oil palm shell-activated carbon was shown to be a capable adsorbent for removing a high percentage of the initial concentration of 4CG in aqueous solution at 30 degrees C. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 2,4,6-Trichlorophenol, 2-Chlorophenol, 4-Chloroguaiacol, Activated Carbon, Activation, Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Adsorption Kinetics, Agitation, Analysis, Aqueous Solution, BET, Capacity, Carbon, Chemical Activation, Chlorophenols, CO2, Concentration, Data, Electron Microscopy, Equilibrium, Freundlich, Functional Groups, H3PO4, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Model, Models, Monolayer, Morphology, N-2, N2, NaOH, Oil Palm Shell, Oil Palm Shell Activated Carbon, pH, Phenols, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Pyrolysis, Removal, Rights, Scanning Electron Microscopy, Sodium, Sodium Hydroxide, Solution, Surface, Surface Area, Temkin Isotherm, Uptake, Waste-Water

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Full Text: [2010\Desalination257, 46.pdf](2010/Desalination257,%2046.pdf)

Abstract: Retention of citric acid, an organic ligand, from aqueous phase was studied using activated carbon (15% K2CO3 treated) prepared from Havea braziliansis saw dust obtained from a local timber industry at Kodangavila, Trivandrum, Kerala, India. Batch adsorption studies were performed to evaluate the effect of various parameters such as pH, contact time, initial citric acid concentration and adsorbent dose for the adsorptive retention process. The mechanism of citric acid adsorption from aqueous solution was investigated by conducting pH as well as kinetic studies. The maximum adsorption of citric acid onto activated carbon occurred at a pH value around 5.0. The kinetic adsorption data was in close agreement with pseudo-first-order than pseudo-second-order expression. The solution pH, zero point charge (pHzpc) and citric acid speciation played important roles in the extent of citric acid adsorption onto activated carbon from water and wastewaters. The equilibrium data obtained from isotherm studies explains the L-type adsorption process and follows a Langmuir type isotherm model. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Aqueous Phase, Aqueous Solution, Batch Adsorption, Carbon, Charge, Chitin, Citric Acid, Concentration, Data, Dust, Dye, Equilibrium, Expression, India, Isotherm, Isotherm Model, Kinetic, Kinetic Adsorption, Kinetic Studies, Kinetics, Langmuir, Ligand, Local, Mechanism, Model, Organic, Particles, pH, pH Value, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Retention, Rights, Saw Dust, Sawdust, Sawdust Activated Carbon, Solution, Speciation, Value, Wastewaters, Water, Zero Point Charge

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Full Text: [2010\Desalination257, 93.pdf](2010/Desalination257,%2093.pdf)

Abstract: Simulated pseudo-second-order kinetic adsorption data were analyzed by different methods of least-squares regression. The methods used were non-linear regression and four linearized forms of the pseudo-second-order equation. The simulated data were compromised with three different homoskedastic and heteroskedastic error distributions. In the presence of all types of error distributions, non-linear regression was the most robust method and provided the most accurate and efficient estimates of the kinetic parameters. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Basic-Dyes, Data, Diffusion, Error, Estimates, Forms, Isotherm, Kinetic, Kinetic Adsorption, Kinetic Equations, Kinetic Parameters, Least Squares, Least-Squares, Methods, Michaelis-Menten, Modeling, Non-Linear Regression, Nonlinear Regression, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Regression, Rights, Sorption, Systems

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Full Text: [2010\Desalination257, 102.pdf](2010/Desalination257,%20102.pdf)

Abstract: Two kinds of natural zeolite, Korea Pohang clinoptilolite (PC) and Japan Haruna chabazite (HC) were modified by hexadecyltrimethylammonium bromide (HDTMA) and used to remove chromate from water. The structures of HDTMA-zeolites were characterized by FTIR and XRD. The effects of contact time, initial Cr(VI) concentration, pH of solution, ionic strength and the coexisting ions on the chromate adsorption were evaluated. Our results show that Cr(VI) adsorption can reach equilibrium state very fast which can be described by pseudo-second order kinetic model. The Cr(VI) adsorption capacity of HDTMA-zeolites are significantly higher than that of PC and HC. In particular, the Cr(VI) removal of HDTMA-PC is optimized within a wide solution pH range of 3.0-11.0, while that of HDTMA-HC is very sensitive to pH value that it can only be optimized in a narrow pH range near 3.0; and HDTMA-HC shows a much higher Cr(VI) adsorption in comparison with HDTMA-PC and other HDTMA-chabazite. Meanwhile, ionic strength for solution has a significant effect on chromate removal for HDTMA-zeolites. The chromate removal is not affected by coexisting of chloride, nitrate, calcium and magnesium ions but is reduced in the presence of sulfate, bicarbonate and phosphate ions. Furthermore, HDTMA-zeolites can achieve high regeneration efficiency. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Adsorption Capacity, Aqueous-Solution, Bromide, Calcium, Capacity, Cationic Surfactant, Chabazite, Chloride, Chromate, Clinoptilolite, Columns, Comparison, Concentration, Cr(VI), Cr(VI) Adsorption, Cr(VI) Removal, Efficiency, Equilibrium, FTIR, Hexadecyltrimethylammonium, Hexadecyltrimethylammonium Bromide Modified Zeolite, Hexavalent Chromium, Ionic Strength, Ions, Isotherm, Japan, Kinetic, Kinetic Model, Kinetics, Korea, Magnesium, Model, Modified, Modified Zeolite, Natural, Natural Clinoptilolite, Natural Zeolite, Nitrate, pH, pH Value, Phosphate, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Regeneration, Removal, Rights, Solution, Sorption, State, Strength, Sulfate, Surfactant, Value, Waste, Water, XRD, Zeolite

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Full Text: [2010\Desalination257, 163.pdf](2010/Desalination257,%20163.pdf)

Abstract: This paper presents the adsorption of Cu(II) ions from aqueous solution on modified Unye bentonite. Adsorption of Cu(II) ions by magnesium oxide-coated bentonite (MCB) sample was investigated as a function of the initial Cu (II) concentration, solution pH, ionic strength, temperature and inorganic ligands (Cl-, SO42-, and HPO42-). Changes in the surfaces and structure were characterized by means of XRD and N-2 gas adsorption data. The Langmuir monolayer adsorption capacity of MCB in 0.1 M KNO3 solution was estimated as 58.44 mg/g. Delta G, Delta H and Delta S values were evaluated for MCB to be -9.50 kJ/mol (at 303 K), 43.81 kJ/mol and 175.85 J/mol K. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Adsorption Characteristics, Aqueous Solution, Bentonite, Capacity, Clay, Clay, Concentration, Copper, Cu, Cu(II), Cu(II), Cu(II) Ions, Data, Equilibrium, Fly-Ash, Function, Heavy-Metal Ions, Ionic Strength, Ions, Langmuir, Lead(II), Ligands, Magnesium, Manganese, Modified, Monolayer, N-2, N2, Pb(II), Performance, pH, Removal, Rights, Solution, Strength, Structure, Surfaces, Temperature, Thermodynamic, XRD

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Full Text: [2010\Desalination257, 177.pdf](2010/Desalination257,%20177.pdf)

Abstract: Hg(II)-ion-imprinted polymer (IIP) was prepared by the formation of a binary complex of mercury (imprint ion) with 4-(2-thiazolylazo) resorcinol (TAR) and thermally copolymerizing with methacrylic acid (monomer) and ethylene glycol dimethadrylate (crosslinker), and 2,2’-azobisisobutyronitrile as initiator in cyclohexanol as porogen. Mercury(II) was leached with 0.5 M HCl-1 M thiourea. Control polymer (CP) was also prepared without using imprint ion. The prepared IIP and CP were characterized with FT-IR, microanalysis, SEM analysis and surface area measurement. The effect of pH, adsorption kinetic and adsorption isotherm of imprinted polymer and control polymer were studied. The mechanism for adsorption of mercury was found to follow Freundlich isotherm and pseudo first order model. The adsorption capacity of Hg(II) on IIP and CP is 125 and 57.6 mu mol g-1, respectively. The relative selectivity factor (alpha(r)) values of Hg(II)/Zn(II), Hg(II)/Cu(II), Hg(II)/Ni(II) and Hg(II)/Co(II) are 62.5, 65.3, 64.6 and 70.6, respectively. The detection limit corresponding to three times the standard deviation of the blank was found to be 2.875 mu g L-1. The IIP has been successfully applied for the recovery of trace Hg(II) in real water samples and those spiked with standards. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 4-(2-Thiazolylazo) Resorcinol, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Kinetic, Analysis, Aqueous-Solution, Capacity, Characterization, Control, Ethylene Glycol, First, First Order, Freundlich, Freundlich Isotherm, FT-IR, FTIR, Hg(II), Imprinted Polymer, Ion, Ion-Imprinted Polymer, Isotherm, Kinetic, L1, Measurement, Mechanism, Mercury, Mercury(II), Model, pH, Polymer, Porogen, Preconcentration, Pseudo First Order, Pseudo-First-Order, Recovery, Removal, Resin, Resorcinol, Rights, Selectivity, SEM, Separation, Sorbent, Standard, Standards, Surface, Surface Area, Synthesis, Water, Water Samples

? Zhou, L.M., Liu, Z.R., Liu, J.H. and Huang, Q.W. (2010), Adsorption of Hg(II) from aqueous solution by ethylenediamine-modified magnetic crosslinking chitosan microspheres. *Desalination*, **258** (1-3), 41-47.

Full Text: [2010\Desalination258, 41.pdf](2010/Desalination258,%2041.pdf)

Abstract: In this work, we examined the effects of various parameters, such as pH, contact time, initial concentration, and temperature, on the adsorption of Hg(II) by ethylenediamine-modified magnetic crosslinking chitosan microspheres (EMCR). EMCR had the diameter size range of 80-250 μm, average pore size of 826 nm, BET surface area of 68.6 m2/g, and saturated magnetization of 15.4 emu/g. The maximum uptake of Hg(II) was recorded at pH 5. At pH 3, Hg(II) could be selectively separated from Cd(II), Pb(II), Zn(II), Cu(II), Ca(II), and Mg(II). Equilibrium data were fitted well with Langmuir isotherms with the maximum adsorption capacity of 2.69 mmol/g for Hg(II). Both kinetics and thermodynamic parameters of the adsorption process were obtained. The data indicated that adsorption process was exothermic spontaneous reaction and kinetically proceeded according to pseudo-second-order model. The metal ion-loaded EMCR were regenerated with an efficiency of more than 90% using 0.02-0.1 M thiourea. Crown Copyright (C) 2010 Published by Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Biosorption, Chelating Resin, Chitosan Microsphere, Equilibrium, Ethylenediamine, Gel Beads, Heavy Metals, Hg(II), Isotherms, Kinetics, Langmuir, Magnetic Adsorption, Maximum Adsorption Capacity, Mercury Removal, Metal-Ions, Pb(II), Recovery, Waste Treatment, Water

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Full Text: [2010\Desalination258, 54.pdf](2010/Desalination258,%2054.pdf)

Abstract: In this paper, alpha-ketoglutaric acid-modified chitosan resins (KCR) were successfully prepared. The capacity of KCR as weak cation exchanger for sorbing bisphenol A (BPA) from aqueous solution was compared with crosslinked chitosan resins (CCR) with cetyl trimethyl ammonium bromide (CTAB) as the intermediary of BPA sorbed on sorbent. The BPA removal was found to be dependent on the initial pH, KCR/CTAB dosage, BPA concentration, and contact time. The isothermal data of BPA sorption on KCR was in well agreement with the Langmuir model, and the maximum sorption capacity (Q.) of KCR for BPA was 30.67 mg/g. The BPA sorption process could be described by the pseudo-second-order rate kinetic model. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Biodegradation, BPA, Chemicals, CTAB, Degradation, Derivatives, Hydrophobic Sorption of Hemimicelles, KCR, Kinetic, Langmuir, Oxidation, Removal, Sorption, Water

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Full Text: [2010\Desalination258, 66.pdf](2010/Desalination258,%2066.pdf)

Abstract: This work reports the results of the study of Cadmium (II) removal from aqueous solution by the natural, plentiful and low-cost biosorbent Scolymus hispanicus L. using batch biosorption technique. The biosorption studies were carried out as a function of average biosorbent particle size, pH, biosorbent dosage, contact time, initial metal concentration and temperature. The percentage of biosorption increases with an increase in the biosorbent dosage and the decrease of particle size. The equilibrium metal uptake was increased with an increase in the initial concentration. The maximum biosorption occurred at pH 6.5. Biosorption kinetic data were properly fitted with the pseudo-second-order kinetic model. Equilibrium data were well interpreted by Langmuir model with maximum biosorption capacity of 54.05 mg g(-1). The biosorption is not temperature dependent. The FT-IR spectroscopic analysis of unloaded and Cadmium(II)-loaded Scolymus hispanicus L confirmed that the functional groups on the biosorbent surface were involved in biosorption. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Aqueous-Solutions, Biomass, Biosorption, Cadmium, Cadmium(II), Equilibrium, Isotherm, Kinetic, Kinetics, Langmuir, Lead, Low-Cost, Medicinal-Plants, Metal-Ions, Removal, Sargassum sp, Scolymus Hispanicus l., Sorption, Waste-Water, Wheat Bran

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Full Text: [2010\Desalination258, 128.pdf](2010/Desalination258,%20128.pdf)

Abstract: The present study reports the development of an alternative adsorbent, based on silica modified with a water soluble silsesquioxane containing a double charged 1,4-diazoniabicyclo[2.2.2]octane, employed for removal of the dye brilliant yellow from aqueous solution. The dye removal ability of this adsorbent was determined by batch adsorption procedure. Effects such as pH value and adsorbent dosage on the adsorption capacity were studied. Four kinetic models were applied. The adsorption was best fitted to a fractionary-order kinetic model. The kinetic data were also adjusted to an intra-particle diffusion model resulting three linear regions, indicating that the adsorption kinetics follows multiple sorption rates. The equilibrium data were fitted to Langmuir, Freundlich, Sips and Redlich-Peterson isotherm models. The maximum adsorption capacity was 54 mg g(-1). (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacity, Adsorption Kinetics, Alternative, Aqueous Solution, Aqueous-Solutions, Batch, Batch Adsorption, Batch Adsorption Procedure, Capacity, Data, Development, Diffusion, Diffusion Model, Dye, Dye Removal, Equilibrium, Freundlich, Grafted, Hybrid Materials, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherm, Isotherm Models, Kinetic, Kinetic Model, Kinetic Models, Kinetic-Parameters, Kinetics, Langmuir, Methylene-Blue, Model, Models, Modified, Multiple Sorption, Nonlinear Fitting, Organofunctionalized Silica, Pecan Nutshell, pH, pH Value, Procedure, Rates, Redlich-Peterson, Removal, Rights, Self-Organization, Silica, Silsesquioxane, Solution, Sorption, Sorption Capacity, Statistical Design, Textile Dye, Value, Water, Yellow Passion-Fruit

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Full Text: [2010\Desalination258, 148.pdf](2010/Desalination258,%20148.pdf)

Abstract: The removal of Pb2+ in modified areca waste from aqueous solutions with the Fenton reagent was investigated. Experiments were carried out as function of contact time and initial concentration (4-12 mg/L). The equilibrium adsorption data of Pb2+ on MAW were analyzed by Langmuir and Freundlich models. The equilibrium adsorption data were well described by the Freundlich and Langmuir isotherms. The monolayer adsorption capacity was found to be 3.37 mg/g at pH 6.6 and 323 K. Adsorption data were modeled using the pseudo-first-order, pseudo-second-order and intraparticle diffusion kinetics equations. The experimental data were fitted well the pseudo-second-order kinetics. Isotherms had also been used to obtain the thermodynamic parameters such as free energy (ΔG(0)), enthalpy (ΔH-0) and entropy (ΔS-0) of adsorption. The negative value of ΔG(0) indicates the feasibility and spontaneity of the adsorption process. The positive ΔH-0 suggests the endothermal nature of the adsorption. The positive values of AS reflects the affinity of MAW towards Pb2+. Desorption studies revealed that the MAW can be regenerated using HNO3 by adjusting pH. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Agricultural Waste, Copper, Desorption, Diffusion, Dynamic, Equilibrium, Equilibrium Adsorption, Heavy-Metal Ions, Hevea-Brasiliensis, Isotherms, Kinetic, Kinetics, Langmuir, Modification, Modified Areca Waste, Peat, Removal, Shell, Sorption

? Cortés-Martínez, R., Olguín, M.T. and Solache-Ríos, M. (2010), Cesium sorption by clinoptilolite-rich tuffs in batch and fixed-bed systems. *Desalination*, **258** (1-3), 164-170.

Full Text: [2010\Desalination258, 164.pdf](2010/Desalination258,%20164.pdf)

Abstract: The sorption of cesium by two different clinoptilolite-rich tuffs from Mexico considering both batch and continuous flow systems was investigated. The kinetic and thermodynamic parameters as well as the sorption capacities of the zeolitic materials at different temperatures were evaluated. It was found that the second order model describes the cesium sorption kinetics and the Langmuir-Freundlich model describe the isotherms, in all cases. According with the thermodynamic parameters the cesium sorption mechanism is ion exchange and endothermic in nature. The mineral and chemical composition of the clinoptilolite-rich tuff influences on the cesium sorption properties. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption Behavior, Basic-Dyes, Batch System, Cesium, Clinoptilolite, Column, Cr(VI), Fixed-Bed System, Ions, Isotherms, Kinetic, Kinetics, Models, Removal, Sorption, Waste, Water, Zeolite

? Guclu, G. (2010), Removal of basic dyes from aqueous solutions by dimethyl terephthalate distillation residue. *Desalination*, **259** (1-3), 53-58.

Full Text: [2010\Desalination259, 53.pdf](2010/Desalination259,%2053.pdf)

Abstract: In this study the removal of basic dyes from aqueous solutions by residue acid mixture (RAM) obtained from dimethyl terephthalate distillation residue was investigated. Adsorption experiments were carried out at ambient temperature. A fixed amount of sample was immersed in 50 mL basic dye (500 mg/L) solutions. The amount of residual dye concentrations was determined using UV/Vis Spectrophotometer at wavelength 530 nm Safranine-T (ST), 622 nm Brilliant Cresyl Blue (BCB), 638 nm Nile Blue (NB) and 618 nm Brilliant Green (BG). Adsorption capacities of RAM for basic dyes decrease with the following order: BG>ST>NB>BCB. The maximum adsorption capacities for BG, NB, ST and BCB onto RAM were found to be 107, 22, 17, 13 mg/g, respectively. Adsorption kinetic data were tested using pseudo-first-order and pseudo-second-order models. The results show that the pseudo-second-order kinetic model fitted better than the data obtained from pseudo-first-order model for the adsorption of basic dyes onto RAM. Adsorption data were modeled using Langmuir and Freundlich adsorption isotherms. The result revealed that the adsorption of basic dyes onto RAM fit very well with the Langmuir isotherm model. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Adsorption, Adsorption, Adsorption Capacities, Adsorption Isotherms, Adsorption Kinetic, Aqueous Solutions, Basic Dye, Basic Dyes, Clay, Data, Dimethyl Terephthalate, Dye, Dyes, Experiments, Freundlich, Freundlich Isotherm, Hydrogels, Isotherm, Isotherm Model, Isotherms, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Model, Models, Nile, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Solutions, Sorption, Temperature

? Xiong, J.B. and Mahmood, Q. (2010), Adsorptive removal of phosphate from aqueous media by peat. *Desalination*, **259** (1-3), 59-64.

Full Text: [2010\Desalination259, 59.pdf](2010/Desalination259,%2059.pdf)

Abstract: The identification of effective filtering materials is imperative for cleaning wastewater before its discharge. Laboratory-scale batch experiments and column leaching were conducted to evaluate the effectiveness of peat in removing phosphate (P) from wastewater. Major factors involved, including the initial P and adsorbent concentrations, adsorption kinetics, temperature, and pH were also investigated. Peat was effective in P removal from wastewater, especially at its low P concentrations (1-2 mg/L). The maximum P adsorption on peat was 8.91 mg/g and the P adsorption followed the Langmuir and Freundlich model. The adsorption on peat decreased with increasing temperature and was the highest at pH 6.5. Generally, P removal increased with increasing adsorbent dose rate. Column flow-through tests using a secondary effluent confirmed the results obtained from batch experiment. The removal rates of dissolved phosphate (DP) and total phosphate (TP) by a peat column from the secondary effluent were 94-99% and 76-95%, respectively. These results suggested that based on large surface area and high amorphous Fe and Al contents, peat possessed great potential for its use as substrate bed material for adsorptive P removal from secondary wastewaters. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbent Dose, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Aluminum, Batch, Batch Experiments, Carbon, Column, Column Leaching, Constructed Wetland Systems, Discharge, Dissolved, Effectiveness, Experiment, Experiments, Extractable Fe, Freundlich, Freundlich Model, Identification, Ions, Iron, Kinetics, Langmuir, Langmuir and Freundlich Model, Leaching, Media, Model, Moss, P, Peat, pH, Phosphate, Phosphate Removal, Phosphorus Removal, Potential, Rates, Removal, Removal of Phosphate, Rights, Secondary Effluent, Soils, Sorption, Surface, Surface Area, Temperature, Wastewater, Wastewaters

? Svilović, S., Rušić, D. and Bašić, A. (2010), Investigations of different kinetic models of copper ions sorption on zeolite 13X. *Desalination*, **259** (1-3), 71-75.

Full Text: [2010\Desalination259, 71.pdf](2010/Desalination259,%2071.pdf)

Abstract: Removal of copper ions from aqueous solutions using zeolite 13X has been studied by a batch technique. Experiments were carried out as a function of solute concentration, temperature and particle size. Several kinetic models were used to test the experimental rate data and to examine the controlling mechanism of the sorption process. Lagergren pseudo first order and the pseudo second order (Ho) models were analyzed using nonlinear regression technique while Weber-Morris model was analyzed using linear least squares method. The obtained results indicated that synthetic zeolite 13X could be used as an efficient material for the removal of copper ions from wastewaters. The sorption capacity of copper ions increases with the initial concentration and temperature. Particle size has a negligible effect on the sorption capacity of zeolite 13X. Kinetic study has shown that the best fit is achieved when the Weber-Morris model was applied and that sorption is controlled by intraparticle diffusion. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 13x, Activated Carbon, Aqueous Solutions, Aqueous-Solutions, Batch, Capacity, Concentration, Copper, Data, Diffusion, Experimental, First, First Order, Function, Intraparticle Diffusion, Ions, Kinetic, Kinetic Models, Kinetic Study, Kinetics, Mechanism, Model, Models, Nonlinear Regression, Particle Size, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Regression, Removal, Rights, Second Order, Second-Order, Size, Solutions, Sorption, Sorption Capacity, Sorption Process, Temperature, Waste, Wastewaters, Zeolite, Zeolite 13x

? Hu, X.J., Li, Y.S., Wang, Y., Li, X.X., Li, H.Y., Liu, X. and Zhang, P. (2010), Adsorption kinetics, thermodynamics and isotherm of thiacalix[4]arene-loaded resin to heavy metal ions. *Desalination*, **259** (1-3), 76-83.

Full Text: [2010\Desalination259, 76.pdf](2010/Desalination259,%2076.pdf)

Abstract: A thiacalix[4]arene-loaded resin was prepared and characterized. The adsorption capacities of the thiacalix [4]arene-loaded resin toward Cu2+, Pb2+ and Cd2+ ions were investigated by batch adsorption experiments. It was found that the selective adsorption capacities of the thiacalix[4]arene-loaded resin are mainly attributed to the complex of the loaded thiacalix[4]arene with heavy metal ions. Various factors affecting the adsorption capacities such as contact time, temperature, pH and initial concentration of the metal ions were investigated. The adsorption kinetics was evaluated with the pseudo-first-order and pseudo-second-order models. The equilibrium data were analyzed using Langmuir and Freundlich isotherm models by non-linear regression. The adsorption kinetics followed the pseudo-second-order rate law for the three heavy metal ions, indicating chemical sorption as the rate-limiting step of the adsorption mechanism. The adsorption of heavy metal ions onto the thiacalix[4]arene-loaded resin is fitted better to the Langmuir isotherm than to the Freundlich isotherm, and the maximum adsorption capacities were 21.4, 47.9, and 44.9 mg/g for Cu2+, Pb2+ and Cd2+ ions respectively. Thermodynamic studies revealed that the adsorptions of the thiacalix[4]arene-loaded resin to heavy metal ions were spontaneous and exothermic processes with an increase of entropy. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Capacities, Adsorption Kinetics, Adsorption Mechanism, Aqueous-Solutions, Batch, Batch Adsorption, Biosorption, Cd2+, Chemical, Concentration, Cu2+, Data, Entropy, Equilibrium, Exchange-Resin, Exothermic, Experiments, Fly-Ash, Freundlich, Freundlich Isotherm, Heavy Metal, Heavy Metal Ions, Immobilization, Ions, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Law, Mechanism, Metal, Metal Ions, Models, Non-Linear Regression, Nonlinear Regression, Pb2+, pH, Pinus-Sylvestris, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Rate Law, Rate Limiting Step, Rate-Limiting Step, Regression, Removal, Resin, Rights, Selective Adsorption, Solvent-Extraction, Sorption, Temperature, Thermodynamic, Thermodynamics, Thiacalix[4]arene, Waste-Water

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Full Text: [2010\Desalination259, 120.pdf](2010/Desalination259,%20120.pdf)

Abstract: Lawny grass is selected as a novel adsorbent to remove Cd(II) from aqueous solution. Different adsorbents are prepared by some reagents and characterized by elemental analysis, SEM and FTIR. The acidic and basic sites and points of zero charge are also determined. Influences of pH, contact time, initial concentration of Cd (II), biosorbent dosage and temperature on adsorption of Cd(II) are discussed. Different models are used to fit experimental data. Results show that experimental data follows Langmuir-Freundlich model and pseudo-second-order model. The maximum adsorption capacities obtained from Langmuir-Freundlich are 1.29 and 1.19 mol kg-1 by using 1CG and 0.6CG (lawny grass modified by 1 mol L-1 or 0.6 mol L-1 citric acid), respectively. Equilibrium time is obtained at 60-90 min. In addition, thermodynamic parameters indicate that this adsorption process is endothermic and spontaneous. Breakthrough curves of column experiments show that the breakthrough begins at 100 BV (bed volume) by 0.6CG and 138 BV by 1CG. 0.1 mol L-1 HCl is selected to be as elution for regeneration of the column. After four cycles of adsorption-desorption, the adsorption capacity of regenerated column is similar to new column. Therefore, lawny grass can be used as an efficient and cost effective biosorbent for removing Cd (II) from aqueous solution. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Capacities, Adsorption Capacity, Adsorption-Desorption, Analysis, Aqueous Solution, Aqueous-Solutions, Biosorbent, Biosorption, Biosorption, Breakthrough, Cadmium, Cadmium, Capacity, Carbons, Cd, Cd(II), Cellulose, Charge, Citric Acid, Column, Column Experiments, Concentration, Cost, Cost-Effective, Data, Effluents, Elution, Endothermic, Equilibrium, Experimental, Experiments, FTIR, Heavy-Metals, Kinetics, L1, Langmuir-Freundlich, Lawny Grass, Metal-Ions, Model, Models, Modified, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Regeneration, Removal, Rights, SEM, Solution, Surface-Chemistry, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Volume, Waste

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Full Text: [2010\Desalination259, 131.pdf](2010/Desalination259,%20131.pdf)

Abstract: Cadmium and its compounds present in waste water are well known potential environmental hazards. The present contribution deals with the removal of cadmium ion using clay soil mixed with different admixture (cement, gypsum, lime, bentonite) as adsorbent in laboratory scale experiment. The removal of cadmium was studied both in batch and continuous method. The influence of cadmium initial concentration, pH, amount of adsorbent on adsorption capacity, temperature was studied in batch method. The maximum dye adsorption was observed at pH 5.5. Different adsorption isotherm models (Langmuir, Freundlich, Tempkin isotherm) were used to describe the distribution of cadmium between the liquid and solid phases in batch studies and it was observed that Langmuir adsorption isotherm better represents the experimental data. The Arrhenius equation was used to evaluate the activation parameter. The activation energy was estimated as 67.25 kJ mole(-1) which indicate that the adsorption of cadmium using soil was chemical adsorption process. These adsorption studies were applied in continuous experiment also. In continuous experiment it was observed that the % removal was 95-99%. A mathematical treatment of this adsorption phenomenon has been developed and it was observed that the experimental results showed satisfactory agreement with the theoretical predicted results. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activation, Activation Energy, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherm Models, Adsorption Process, Assessment, Batch, Batch Method, Bentonite, Cadmium, Capacity, Chemical Adsorption, Clay, Clay Liners, Clayey Soil, Compacted Clay, Contaminants, Contamination of Cadmium, Contribution, Different Admixture, Diffusion, Dye, Dye Adsorption, Effective Treatment, Energy, Environmental, Experimental, Freundlich, Gypsum, Hydraulic Conductivity, Isotherm, Isotherm Models, Kinetics, Langmuir, Langmuir Adsorption, Langmuir Adsorption Isotherm, Leachate Migration, Natural Clay, pH, Removal, Soil, Temperature, Thermodynamics, Treatment, Waste, Waste Water, Wastewater, Water

? Qin, C.H., Wang, R. and Ma, W. (2010), Adsorption kinetic studies of calcium ions onto Ca-Selective zeolite. *Desalination*, **259** (1-3), 156-160.

Full Text: [2010\Desalination259, 156.pdf](2010/Desalination259,%20156.pdf)

Abstract: In this paper, a cost-effective material, Ca-Selective zeolite was synthesized and investigated to be used in the sorption of calcium. The adsorptive experiments were carried out in batch systems. Effects of contact time, initial concentration and ionic strength on the sorption of calcium were tested. Three different kinetic models including pseudo-first-order model, pseudo-second-order model and intra-particle diffusion model were used to evaluate the adsorption kinetics. The results obtained from the study illustrated that chemical exchange and intra-particle diffusion may be the rate-determining steps of the exchange process. Crown Copyright (C) 2010 Published by Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Kinetic, Adsorption Kinetics, Aqueous-Solutions, Batch, Brine, Ca-Selective Zeolite, Calcium, Chemical, Concentration, Cost-Effective, Diffusion, Diffusion Model, Exchange, Experiments, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Ionic Strength, Ions, Kinetic, Kinetic Models, Kinetic Studies, Kinetics, Model, Models, Natural Sepiolite, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Rights, Sawdust, Sea-Water, Sorption, Strength, Systems, Technologies, Zeolite

? Ozcan, S., Tor, A. and Aydin, M.E. (2010), Removal of Cr(VI) from aqueous solution by polysulfone microcapsules containing Cyanex 923 as extraction reagent. *Desalination*, **259** (1-3), 179-186.

Full Text: [2010\Desalination259, 179.pdf](2010/Desalination259,%20179.pdf)

Abstract: This paper describes the removal of Cr(VI) from aqueous solution in batch sorption technique by using polysulfone microcapsules containing Cyanex 923 as extraction reagent. The microcapsules containing Cyanex 923 (MCs-Cyanex 923) were prepared by solvent evaporation method and characterized by using optical microscope, Scanning Electron Microscopy (SEM), Fourier Transform Infrared Spectroscopy (FT-IR) and Thermal Gravimetric Analysis (TGA). The results showed that maximum removal of Cr(VI) was obtained when ratio of Cyanex 923 to polysulfone was 1.0. The complex formation between Cr(VI) and Cyanex 923 favoured at initial pH of 1.0. The equilibrium time was 30 min and it obeyed the pseudo second-order kinetic model. The Redlich Peterson and Langmuir isotherm models better represented the sorption data in comparison to Freundlich isotherm. The Langmuir sorption capacity of MCs-Cyanex 923 for Cr(VI) was 0.430 mmol g-1. The MCs-Cyanex 923 preferably sorbed Cr(VI) against various metal ions, including Cr(III), Ni(II), Pb(II), Cu(II), Zn(II), Cd(II), Co(II). The regeneration studies also showed that MCs-Cyanex 923 could be re-used for the adsorption of Cr(VI) from aqueous solutions over 3 cycles. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous Solution, Aqueous Solutions, Batch, Capacity, Cd(II), Chromium(VI), Co(II), Comparison, Cr(III), Cr(VI), Cu(II), Cyanex 923, Data, Equilibrium, Extraction, Facilitated Transport, Freundlich, Freundlich Isotherm, FT-IR, FTIR, Hexavalent Chromium, Ions, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Metal, Metal Ions, Metal-Ions, Microcapsules, Model, Models, N-Butyl Phosphate, Ni(II), Pb(II), pH, Polystyrene Microcapsules, Polysulfone, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Redlich-Peterson, Regeneration, Removal, Rights, Second Order, Second-Order, Sem, Separation, Solution, Solutions, Solvent-Extraction, Sorption, Sorption, Sorption Capacity, Supported Liquid-Membrane, TGA, Zn(II)

? Xing, Y., Liu, D. and Zhang, L.P. (2010), Enhanced adsorption of Methylene Blue by EDTAD-modified sugarcane bagasse and photocatalytic regeneration of the adsorbent. *Desalination*, **259** (1-3), 187-191.

Full Text: [2010\Desalination259, 187.pdf](2010/Desalination259,%20187.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 Methylene Blue (MB) showed a significant increase compared with SB. The maximum adsorption capacity was 115.3 mg g-1 for MB, 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. Photocatalytic regeneration of spent EDTAD-SB using UV/TiO2 is effective. Further, the regenerated EDTAD-SB exhibits 85% efficiency for subsequent adsorption cycle with MB aqueous solutions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Aqueous Solutions, Aqueous-Solutions, Bagasse, Basic Dye, Biosorption, Capacity, Chemisorption, Correlation, Efficiency, Ethylenediaminetetraacetic Dianhydride, FTIR, Infrared Spectroscopy, Ions, Kinetic, Kinetic Model, Kinetic Studies, Langmuir, Langmuir Equation, Mb, Methylene Blue, Model, Modified, Photocatalytic, Photocatalytic Regeneration, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Regeneration, Removal, Rights, Solutions, Sorption, Spectroscopy, Sugarcane, Sugarcane Bagasse, UV, TiO2, Waste

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Full Text: [2010\Desalination259, 258.pdf](2010/Desalination259,%20258.pdf)

Abstract: A series of carboxymethyl cellulose-g-poly (acrylic acid)/attapulgite (CMC-g-PAA/APT) hydrogel composites was prepared and used for Pb(II) adsorption from aqueous solution. The effects of APT content, pH value, contact time, initial concentration and ionic strength on adsorption were investigated. Results from kinetic experiments showed that adsorption rate of Pb(II) ions onto the composite was quite fast. Adsorption equilibrium may be reached within 60 min and more than 90% of the equilibrium adsorption was achieved within the initial 10 min and 30 min for the composites with 5 wt.% and 20 wt.% APT, respectively. The adsorption process can be well described by the pseudo-second-order kinetic model, and the equilibrium adsorption isotherm was closely fitted with the Langmuir model. FTIR spectra before and after adsorption of Pb(II) on the composite revealed that complexation was considered as the main adsorption mechanism. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Equilibrium, Adsorption Isotherm, Adsorption Mechanism, Adsorption Rate, Aqueous Solution, Attapulgite, Cadmium Ions, Carboxymethyl Cellulose, Complexation, Composite, Composites, Concentration, Copolymer, Equilibrium, Experiments, FTIR, FTIR Spectra, Hydrogel, Hydrogel Composite, Ionic Strength, Ions, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Model, Lead, Lead Adsorption, Mechanism, Mercury, Methylene-Blue, Model, Pb(II), Pb(II) Ions, pH, pH Value, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Solution, Sorption, Strength, Superabsorbent Composites, Value

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Full Text: [2010\Desalination260, 29.pdf](2010/Desalination260,%2029.pdf)

Abstract: Perfluorooctane sulfonate (n-PFOS) is the latest chemical categorized as persistence organic pollutants (POPs). n-PFOS appears in the environmental water and tap water, which mainly comes from industrial wastewater. The process of adsorption has been identified as an effective technique to eliminate n-PFOS in water. We studied the sorption kinetics and sorption isotherms of n-PFOS for the non ion-exchange filter materials of Dow V493, Dow L493, Amb XAD and Filtrasorb 400 (GAC) by batch experiments. and the same materials were checked with a column experiment. Amb XAD 4 was recognized as the best candidate among the four filter materials tested. Dow V493 and Dow L493 showed higher Freundlich constant and lower kinetic constant whereas GAC showed highest kinetic constant and lowest Freundlich constant suggesting comparatively less performance at real application. This fact was proved by the column test results by giving the best performance by Amb XAD4. It was noticed in the column test that Amb XAD 4 removed 99.99% PFOS up to 23,000 bed volumes pass through with the condition of 10 mu g/L inflow concentration and flow rate of 15 mL/min (0.75 bed volumes/min). In the recovery experiment, ion-exchange polymers showed a high possibility to regenerate by an organic solvent. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorption, Application, Aqueous-Solution, Batch, Batch Experiments, Carbon, Chemical, Column, Column Experiment, Column Test, Concentration, Decomposition, Environmental, Experiment, Experiments, Flow, Flow Rate, Freundlich, Freundlich Constant, Gac, Granular Activated Carbon, Industrial Wastewater, Ion Exchange, Ion-Exchange, Ionexchange, Isotherms, Japan, Kinetic, Kinetics, Kinetics and Sorption, N-PFOS, Non Ion-Exchange Polymers, Organic, Organic Pollutants, Perfluorinated Surfactants, Performance, Persistence, Phenol, Pollutants, Polymers, Recovery, Removal, Resins, Rights, Sorption, Sorption Isotherms, Sorption Kinetics, Tap Water, Wastewater, Water, XAD-4

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Full Text: [2010\Desalination260, 107.pdf](2010/Desalination260,%20107.pdf)

Abstract: This study focused on the preparation of a thermal decomposition product of alunite and potassium chloride mixture as an adsorbent for the removal of phosphate ions from aqueous solutions. The adsorbed phosphate ions were quantitatively determined by using ion chromatographic method. The adsorption of phosphate onto adsorbent was strongly dependent on pH and on ionic strength. The optimum pH for the adsorption of phosphate was 3.0. Contact time was 40 min to reach adsorption equilibrium. The equilibrium data fitted well to Langmuir isotherm model. The thermodynamic parameters (ΔH-0, ΔS-0 and ΔG(0)) of phosphate adsorption at different temperatures calculated from the temperature-dependent adsorption isotherms indicated that the adsorption process was endothermic. The phosphate adsorption was also well applied in continuous system. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorbent, Adsorption, Adsorption, Adsorption Equilibrium, Adsorption Isotherms, Alunite, Aqueous Solutions, Aqueous-Solutions, Biosorption, Calcined-Alunite, Chloride, Continuous System, Data, Decomposition, Dye, Endothermic, Environmental, Equilibrium, Ionic Strength, Ions, Isotherm, Isotherm Model, Isotherms, Kinetics, Kinetics Ion Chromatography, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Mechanism, Model, pH, Phosphate, Phosphate Adsorption, Phosphate Removal, Potassium, Potassium Chloride, Potential, Preparation, Removal, Removal of Phosphate, Rhizopus, Rights, Solutions, Strength, Thermodynamic, Thermodynamic Parameters

? Pengthamkeerati, P., Satapanajaru, T., Chatsatapattayakul, N., Chairattanamanokorn, P. and Sananwai, N. (2010), Alkaline treatment of biomass fly ash for reactive dye removal from aqueous solution. *Desalination*, **261** (1-2), 34-40.

Full Text: [2010\Desalination261, 34.pdf](2010/Desalination261,%2034.pdf)

Abstract: Biomass fly ash was treated with alkaline solution to enhance its adsorption capacity of Reactive Black 5 dye. The results revealed that the alkaline concentration, solution to fly ash ratio, treatment temperature and treatment time had a positive effect on the dye adsorption capacity of the treated fly ash (TFA), due to dissolving SiO2 and increasing the proportion of unburned carbon. In addition, the dye adsorption behavior of the TEA in aqueous solution was investigated. The effects of various experimental parameters (initial pH, initial dye concentration and contact time) were determined spectrophotometrically. The dye adsorption capacity of the TFA was maximized at an alkaline pH (8.2-10.4). The adsorption capacity of dye by the TFA increased with increasing initial dye concentration. Equilibrium data fitted well with the Langmuir model in the range of 50-700 mg L-1 and the maximum dye adsorption capacity was 107.53 mg g-1. The sorption data provided a good fit with a pseudo-second order kinetic model. These results suggested that treating biomass fly ash with alkaline solution is an effective method for enhancing dye removal efficiency. The TFA obtained can be used as an alternative to commercial activated carbon for treating dye wastewater. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Behavior, Adsorption Capacity, Adsorption Isotherm, Alkaline Treatment, Alternative, Aqueous Solution, Behavior, Biomass, Capacity, Carbon, Concentration, Data, Dioxide, Dye, Dye Adsorption, Dye Removal, Dye Wastewater, Efficiency, Equilibrium, Experimental, Fly Ash, Kinetic, Kinetic Model, L1, Langmuir, Langmuir Model, Model, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Reactive Black 5, Reactive Black 5 Dye, Reactive Dye, Removal, Removal Efficiency, Rice Hull Ash, Rights, Silica, Solution, Sorption, Temperature, Treatment, Unburned Carbon, Unburned Carbon, Waste-Water, Wastewater, Zeolites

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Full Text: [2010\Desalination261, 52.pdf](2010/Desalination261,%2052.pdf)

Abstract: Cashew nut shell (CNS) - a novel, low cost adsorbent prepared from agricultural waste has been utilized as the adsorbent for the removal of Congo red (CR) dye from an aqueous solution. The effect of pH, adsorbent dose, initial dye concentration, time and temperature on adsorption was studied. The results indicate that CNS can be employed as a low cost alternative compared to other commercial adsorbents in the removal of dyes from wastewater. The experimental data were analyzed by Langmuir, Freundlich, Redlich-Peterson, Koble-Corrigan, Sips, Toth, Temkin and Dubinin-Radushkevich adsorption isotherms. The characteristic parameters for each isotherm and related correlation coefficients have been determined using MATLAB 7.1. Thermodynamic parameters such as ΔGº, ΔHº and ΔSº have also been evaluated and it has been found that the sorption process was feasible, spontaneous and exothermic in nature. Pseudo-first-order, pseudo-second-order and intraparticle diffusion models were used to fit the experimental data. Kinetic parameters, rate constants, equilibrium sorption capacities and related correlation coefficients, for each kinetic model were calculated and discussed. It was shown that the adsorption of CR could be described by the pseudo-second-order equation, suggesting that the adsorption process is a presumably chemisorption. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption Isotherms, Agricultural, Agricultural Waste, Alternative, Anionic Dyes, Aqueous Solution, Cashew Nut Shell, Chemisorption, Coal, Color Removal, Concentration, Congo Red, Congo Red Dye, Congo-Red, Correlation, Cost, Cr, Data, Diffusion, Dye, Dyes, Equilibrium, Equilibrium Isotherm, Exothermic, Experimental, Fly-Ash, Freundlich, Intraparticle Diffusion, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetic Parameters, Kinetics, Kinetics and Thermodynamics, Langmuir, Low Cost, Low Cost Adsorbent, Model, Models, pH, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Rate Constants, Redlich-Peterson, Removal, Removal of Dyes, Rice-Husk, Rights, Sawdust, Solution, Sorption, Sorption Process, Temperature, Textile Effluents, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste, Waste-Water, Wastewater

? Anbia, M. and Hariri, S.A. (2010), Removal of methylene blue from aqueous solution using nanoporous SBA-3. *Desalination*, **261** (1-2), 61-66.

Full Text: [2010\Desalination261, 61.pdf](2010/Desalination261,%2061.pdf)

Abstract: The adsorption behavior of methylene blue from aqueous systems onto mesoporous SBA-3 has been studied. Batch experiments were carried out to measure the adsorption as a function of contact time, initial concentration (50-150 mg L-1), pH (4-12), and temperature (303, 313 and 323 K). The equilibrium of the process was achieved within 1 h. The sorption of methylene blue on the mesoporous silica SBA-3 slightly increases with increasing pH, and temperature, indicating an endothermic process. Adsorption isotherms were fitted with the Langmuir, Freundlich and Temkin models. The kinetic data were analyzed using pseudo-first-order and pseudo-second-order models. The adsorption kinetics of methylene blue on mesoporous SBA-3 matched well with pseudo-second order kinetic model. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption, Adsorption Behavior, Adsorption Isotherms, Adsorption Kinetics, Aqueous Solution, Behavior, Coal, Concentration, Data, Dye, Dye Removal, Endothermic, Equilibrium, Experiments, Freundlich, Function, Isotherms, Kinetic, Kinetic Model, Kinetics, L1, Langmuir, Measure, Mechanism, Mesoporous, Mesoporous Silica, Methylene Blue, Model, Models, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, SBA-3, Silica, Solution, Sorption, Systems, Temperature

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Full Text: [2010\Desalination262, 31.pdf](2010/Desalination262,%2031.pdf)

Abstract: Chemical oxygen demand (COD) and ammoniacal nitrogen have always been the crucially problematic parameters in landfill leachate treatment. This study was conducted to investigate the adsorption properties of ammoniacal nitrogen and COD in semi-aerobic leachate from the Pulau Burung landfill site on zeolite, activated carbon and a new composite media in terms of adsorption isotherm and kinetic. The results show that all adsorbents fitted well with both Langmuir and Freundlich isotherms (R-2>0.9) for ammonia adsorption. A comparison study indicated that the adsorption capacity of composite adsorbent towards ammoniacal nitrogen was higher than zeolite and activated carbon and comparable to activated carbon for COD. Findings from a kinetic study indicated that the adsorption of ammonia on new composite adsorbent and zeolite follow almost all kinetic models such as pseudo-first-order, pseudo-second-order, Elovich and intra-particle diffusion model, although pseudo-second-order was the most dominant. COD adsorption fitted well with the pseudo-second-order kinetic model, while activated carbon obeys the pseudo-first-order and intra-particle models. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Properties, Ammonia, Biological Treatment, Capacity, Carbon, Chemical Oxygen Demand, Coagulation, COD, Comparison, Composite, Composite Adsorbent, Composite Materials, Demand, Diffusion, Diffusion Model, Elovich, Flocculation, Freundlich, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetic Study, Landfill, Landfill Leachate, Landfill Site, Langmuir, Langmuir and Freundlich Isotherms, Leachate, Media, Mineral Adsorbents, Model, Models, Nitrogen, NOV, Oxygen, Precipitation, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Site, Sorbents, Treatment, Waste, Zeolite

? Eren, E., Gumus, H. and Ozbay, N. (2010), Equilibrium and thermodynamic studies of Cu(II) removal by iron oxide modified sepiolite. *Desalination*, **262** (1-3), 43-49.

Full Text: [2010\Desalination262, 43.pdf](2010/Desalination262,%2043.pdf)

Abstract: This paper presents the adsorption of Cu(II) from aqueous solution by raw sepiolite (RS) and iron oxide-coated sepiolite (ICS) samples. Adsorption of Cu(II) by sepiolite samples was investigated as a function of the initial Cu(II) concentration, solution pH, ionic strength, temperature and the presence of an inorganic ligand (Cl-, SO42- and HPO42-). Changes in the surface and structure were characterized by means of XRD, IR and XRF techniques. The Langmuir monolayer adsorption capacities of RS and ICS in 0.1 M NaNO3 solution at 298 K were estimated to be 14.96 and 21.56 mg/g, respectively. Delta G, Delta H and Delta S were evaluated for RS and ICS to be -14.14 kJ/mol (at 298 K), 39.03 kJ/mol and 178 J/mol K. and -16.09 kJ/mol (at 298 K), 32.99 kJ/mol and 165 J/mol K, respectively. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacities, Adsorption Properties, Aqueous Solution, Aqueous-Solution, Clay, Clinoptilolite, Concentration, Copper, Copper Ions, Cu(II), Cu(II) Removal, Equilibrium, Fly-Ash, Function, Heavy-Metal Ions, Ionic Strength, IR, Iron, Iron Oxide, Iron-Oxide, Kaolinite, Langmuir, Ligand, Modified, Monolayer, Montmorillonite, NOV, Oxide, pH, Removal, Rights, RS, Sepiolite, Solution, Sorption, Strength, Structure, Surface, Techniques, Temperature, Thermodynamic, Thermodynamic Studies, Waste-Water, XRD

? Issabayeva, G., Aroua, M.K. and Sulaiman, N.M. (2010), Study on palm shell activated carbon adsorption capacity to remove copper ions from aqueous solutions. *Desalination*, **262** (1-3), 94-98.

Full Text: [2010\Desalination262, 94.pdf](2010/Desalination262,%2094.pdf)

Abstract: Commercially produced in Malaysia palm shell activated carbon (PSAC) was evaluated in terms of adsorption capacity to remove copper ions from aqueous solutions. The results of batch and continuous adsorption experiments showed high adsorption capacity of the untreated PSAC to adsorb copper ions at pH 3 and 5. Higher pH of aqueous solution showed higher uptake of copper. Presence of complexing agents, boric and malonic acids, did not improve copper uptake. Moreover, lower adsorption capacity was observed in the presence of malonic acid that is probably due to the complex formations between the agent and investigated metal. The observed trends for continuous adsorption of copper are in line with the results obtained for batch mode adsorption. Also, changes of the solutions’ initial pHs were measured and they are likely to be associated with the adsorbent’s composition and characteristics. In addition, removal of copper ions from the solutions containing lead ions showed that adsorption capacity of copper was not significantly different compared to the single copper ion system. Whereas, the uptake of lead ions onto activated carbon was substantially reduced in the presence of copper ions, especially at pH 5. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Aqueous Solutions, Batch, Batch Mode, Biosorption, Boric Acid, Capacity, Carbon, Carbon Adsorption, Cation Concentration, Complex, Copper, Cu(II), Equilibrium, Hazelnut, Heavy-Metals, Industrial Waste-Water, Lead, Lead, Malaysia, Malonic Acid, Organic-Matter, Palm Shell, pH, Removal, Sorption, System, Trends, Uptake

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Full Text: [2010\Desalination262, 134.pdf](2010/Desalination262,%20134.pdf)

Abstract: In this work, a novel activated carbon(AC)/ferrospinel composite adsorbent was prepared by a low-temperature refluxing method in the presence of AC suspension. Adsorption characteristics of the as-synthesized composite were examined by using methyl orange (MO) and basic fuchsin (BF) as adsorbates. Batch adsorption experiments were carried out to investigate kinetics and isotherms of dye adsorption onto the composite. Adsorption equilibrium studies showed that adsorption of MO and BF followed the Langmuir model. The monolayer adsorption capacities were 95.8 and 101.0 mg g-1 for MO and BF, respectively. The adsorption kinetics was best described by the pseudo-second-order model. The results indicated that the as-synthesized composite could be considered a promising adsorbent for the removal of dyes from aqueous solutions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Capacities, Adsorption Equilibrium, Adsorption Kinetics, Aqueous Solutions, Basic Fuchsin, Batch Adsorption, Beads, Cationic Dyes, Characteristics, Composite, Dye, Dye Adsorption, Dyes, Equilibrium, Equilibrium Studies, Experiments, Isotherms, Kinetics, Langmuir, Langmuir Model, Low Temperature, Methyl Orange, Methylene-Blue, Mo, Model, Monolayer, NOV, Orange, Organic, Polymer, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Removal of Dyes, Rights, Solutions, Sorption, Suspension, Work

? Deniz, F. and Saygideger, S.D. (2010), Investigation of adsorption characteristics of Basic Red 46 onto gypsum: Equilibrium, kinetic and thermodynamic studies. *Desalination*, **262** (1-3), 161-165.

Full Text: [2010\Desalination262, 161.pdf](2010/Desalination262,%20161.pdf)

Abstract: The adsorption of Basic Red 46 (BR 46) onto gypsum as a low-cost natural adsorbent was studied as a function of initial dye concentration, temperature, contact time and pH regimes. The equilibrium behavior of BR 46 adsorption was examined by the Langmuir, Freundlich and Temkin isotherm models. The equilibrium data fitted well with the Langmuir model. The monolayer adsorption capacity was found as 39.17 mg g-1. The adsorption kinetic was tested by pseudo-first order, pseudo-second order, Elovich and intraparticle diffusion models. The kinetic data were best described by the pseudo-second order model. Thermodynamic investigations indicated that BR 46 adsorption onto gypsum was spontaneous. The results indicated that gypsum could be used as an adsorbent for textile wastewater treatment without high cost. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Kinetic, Agricultural Waste, Aqueous-Solutions, Azo-Dye, Behavior, Biosorption, Capacity, Characteristics, Concentration, Cost, Data, Diffusion, Dye, Elovich, Equilibrium, Fly-Ash, Freundlich, Function, Gypsum, Intraparticle Diffusion, Investigations, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Model, Low Cost, Methylene-Blue, Model, Models, Monolayer, Natural, Natural Adsorbent, NOV, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Removal, Rights, Shells, Sorption, Temkin, Temkin Isotherm, Temperature, Textile Wastewater, Thermodynamic, Thermodynamic Studies, Thermodynamics, Treatment, Wastewater, Wastewater Treatment

? Chen, H., Zhao, J., Dai, G.L., Wu, J.Y. and Van, H. (2010), Adsorption characteristics of Pb(II) from aqueous solution onto a natural biosorbent, fallen *Cinnamomum camphora* leaves. *Desalination*, **262** (1-3), 174-182.

Full Text: [2010\Desalination262, 174.pdf](2010/Desalination262,%20174.pdf)

Abstract: The present work helped in identifying a new low-cost adsorbent, fallen Cinnamomum camphora leaves (FCCL) for effective removal of Pb(II) from aqueous solutions. The adsorption kinetic experiments reveal Pb(II) adsorption onto FCCL follows pseudo-second order kinetics and is mainly controlled by the film diffusion mechanism, which becomes more prominent with increasing initial lead concentration. All equilibrium data obtained at different temperatures fit perfectly with Langmuir isotherm model compared to Freundlich and D-R isotherm models, and the maximum adsorption capacities of Pb(II) adsorbed onto FCCL are 73.15, 73.58, 74.13 and 75.82 mg g-1 at 303.2, 313.2, 323.2 and 333.2 K, respectively. The analysis for variations of FT-IR spectra, the values of the mean free energies of adsorption (Ea) and the Gibbs free energy (ΔG(0)) all demonstrate that the ion exchange and surface complexation models should both be the dominating adsorption mechanism during the adsorption process. The higher initial lead concentrations and temperatures are both more conducive to the enhancement of surface complexation mechanism compared to ion-exchange mechanism. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Capacities, Adsorption Isotherms, Adsorption Kinetic, Adsorption Mechanism, Analysis, Aqueous Solution, Aqueous Solutions, Biosorbent, Biosorption, Characteristics, Cinnamomum Camphora Leaf, Complexation, Concentration, D-R Isotherm, Data, Diffusion, Energy, Equilibrium, Experiments, Film Diffusion, Freundlich, FT-IR, FTIR, FTIR Spectra, Gibbs Free Energy, Ion Exchange, Ion-Exchange, Ionexchange, Ions, Isotherm, Isotherm Model, Isotherm Models, Kinetic, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Lead, Leaf Powder, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Mechanism, Methylene-Blue, Model, Models, Natural, NOV, Pb, Pb(II), Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Removal, Rights, Solution, Solutions, Surface, Surface Complexation, Thermodynamics, Waste-Water, Work

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Full Text: [2010\Desalination262, 243.pdf](2010/Desalination262,%20243.pdf)

Abstract: In this work, the removal of lead and cadmium from an aqueous solution by a local dairy sludge was investigated in a batch system. Biosorption of these heavy metals was studied as a function of solution initial pH, equilibrium time, temperature, biosorbent dose, biosorbent particle diameter and initial metal ion concentration. Maximum sorption was observed at a pH value of 5 and a temperature of 40ºC. Equilibrium uptake increased with increasing metal ion concentration for both metals with a maximum sorption capacity of a 148.6 mg/g for Pb(II) and 66.7 mg/g for Cd(II). The Langmuir model was found to better describe the sorption of lead ions with a correlation factor of 0.99 while Freundlich and Temkin models were better for Cd(II) sorption. The temperature increase from 20 to 40ºC enhanced the uptake of Pb(II) by 20% and Cd(II) by 5%. The sorption kinetics were compatible with the pseudo-second order model for the systems investigated. SEM micrographs were determined before and after sorption. Nitric and hydrochloric acids were used for the metals desorption. Pb(II) was better desorbed by nitric acid whereas Cd(II) was eluted slightly better by chlorhydric acid. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated-Sludge, Aqueous Solution, Aqueous Solutions, Batch, Batch System, Biomass, Biosorbent, Biosorption, Cadmium, Capacity, Cd(II), Concentration, Correlation, Dairy, Dairy Sludge, Desorption, Equilibrium, Freundlich, Function, Heavy Metal, Heavy Metal Ions, Heavy Metals, Ions, Isotherms, Kinetics, Langmuir, Langmuir Model, Lead, Lead Biosorption, Local, Metal, Metal Ions, Metals, Model, Models, NOV, Pb, Pb(II), pH, pH Value, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Removal, Rights, SEM, Sludge, Solution, Solutions, Sorption, Sorption, Sorption Capacity, Sorption Kinetics, Systems, Temkin, Temperature, Uptake, Value, Waste-Water, Work

? Yeddou-Mezenner, N. (2010), Kinetics and mechanism of dye biosorption onto an untreated antibiotic waste. *Desalination*, **262** (1-3), 251-259.

Full Text: [2010\Desalination262, 251.pdf](2010/Desalination262,%20251.pdf)

Abstract: This study focuses on the possible use of Waste P. mutilus to remove Basic Blue 41, cationic dye from aqueous solutions. Batch kinetic studies were carried out as a function of pH, particle size, biomass amount and dye concentration to determine the decolorization efficiency of biosorbent. The highest dye removal yield was achieved at pH 8-9. Equilibrium occurred within about 60 min. The pseudo-second order kinetic model adequately describes the kinetic data. The Langmuir, Freundlich and Tempkin models were used to describe the isotherm data; of which the Freundlich model described the isotherm data with high correlation coefficient (r2=0.994). The maximum monolayer biosorption capacity of biosorbent material was found as 111 mg/g. Also, it was observed that the intra-particle diffusion was not the only rate-controlling step. The adsorption mechanism may be partly a result of the ion exchange or complexation between the dye ions and function groups on dead biomass surface. Finally the proposed biosorbent was successfully used for the decolorization of BB41 in synthetic wastewater conditions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Mechanism, Agaricus-Bisporus, Aqueous Solutions, Aqueous-Solutions, Basic Blue 41, Basic Dyes, Biomass, Biosorbent, Biosorption, Capacity, Cationic Dye, Complexation, Concentration, Correlation, Correlation Coefficient, Data, Decolorization, Diffusion, Dye, Dye Biosorption, Dye Removal, Efficiency, Equilibrium, Freundlich, Freundlich Model, Function, Intra-Particle Diffusion, Intraparticle Diffusion, Ion Exchange, Ion-Exchange, Ions, Isotherm, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Mechanism, Methylene-Blue, Model, Models, Monolayer, NOV, P, Particle Size, pH, Pleurotus Mutilus, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Size, Solutions, Surface, Thuja-Orientalis, Waste, Wastewater

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Full Text: [2010\Desalination264, 97.pdf](2010/Desalination264,%2097.pdf); [2010\Desalination-Malarvizhi-1.pdf](2010/Desalination-Malarvizhi-1.pdf); [2010\Desalination-Malarvizhi.pdf](2010/Desalination-Malarvizhi.pdf)

Abstract: The main aim of the study was to find out the influence of pH and the molecular weight of the dye molecules on adsorption isotherm models using activated carbon in a single solid-liquid system. In this study we derived activated carbon from the waste biomass of wood apple rind. Batch mode experiments were carried out in order to assess the influence of the initial pH and molecular weight of the dye on adsorption capacity of the carbon. Two basic dyes namely Methylene blue and Crystal violet having different molecular Structures have been chosen. To find out the pH effect on the adsorption capacity of the activated carbon, the equilibrium isotherm experiments were carried out by varying the pH of the dye solutions by fixing the carbon dose as constant. A separate study was carried out to note down the change in pH of the dye solution during the adsorption of cationic dye molecules on the activated carbon surface. The adsorption capacity of the activated carbon increased while increasing the pH of the dye solution. The structure of the dye molecules and the nature of pores present on the surface of the activated carbon also decide the adsorption capacity of the carbon.

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Full Text: [2010\Desalination263, 11.pdf](2010/Desalination263,%2011.pdf)

Abstract: The adsorption performance towards methylene blue (MB) from aqueous solution on the anaerobic granular sludge (AGS) was described. The adsorption isotherm data were analyzed by Scatchard plot, which showed that multiple classes of binding sites were involved in the present adsorption process. Three kinds of functional groups, including carboxyl, amino and phosphate group, were identified by potentiometric titration experiment. and the amount of these three functional groups was 0.12, 0.14 and 0.23 mmol/g, respectively. To determine their contribution in the adsorption process, anaerobic granules were used in adsorption after blocking specific functional group. Fourier transformed infrared spectroscopic (FTIR) study was carried out to characterize the modification of the functional groups due to chemical treatments. Carboxyl and amino groups were identified as the most important moieties involved in the binding process since blocking of these two functional groups caused a decrease in the adsorption capacity by 32.68% and 41.89%, respectively. However, the effect of phosphate group on adsorption was slight with the amount of adsorption capacity remaining stable. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Performance, Anaerobic Granular Sludge, Aqueous Solution, Aqueous-Solutions, *Aspergillus-niger*, Binding, Binding Sites, Biosorption Sites, Capacity, Chemical, Chemical Modification, Chemical Treatments, Data, Dye Biosorption, Experiment, Ftir, Functional Group, Functional Groups, Isotherm, MB, Mechanism, Metal-Ions, Methylene Blue, Modification, NOV, Performance, Phosphate, Potentiometric Titration, Reactive Dyes, Removal, *Rhizopus-arrhizus* Biomass, Rights, Sludge, Solution, Sorption

? Rodrigues, L.A. and da Silva, M.L.C.P. (2010), Thermodynamic and kinetic investigations of phosphate adsorption onto hydrous niobium oxide prepared by homogeneous solution method. *Desalination*, **263** (1-3), 29-35.

Full Text: [2010\Desalination263, 29.pdf](2010/Desalination263,%2029.pdf)

Abstract: The adsorption kinetics of phosphate onto Nb2O5 center dot nH2O was investigated at initial phosphate concentrations 10 and 50 mg L-1. The kinetic process was described by a pseudo second-order rate model very well. The adsorption thermodynamics was carried out at 298, 308, 318, 328 and 338 K. The positive values of both ΔH and ΔS suggest an endothermic reaction and increase in randomness at the solid-liquid interface during the adsorption. ΔG values obtained were negative indicating a spontaneous adsorption process. The Langmuir model described the data better than the Freundlich isotherm model. The peak appearing at 1050 cm-1 in IR spectra after adsorption was attributed to the bending vibration of adsorbed phosphate. The effective desorption could be achieved using water at pH 12. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorption, Adsorption Kinetics, Adsorption Thermodynamics, Aqueous-Solutions, Catalysts, Coir Pith, Data, Dehydration, Desorption, Endothermic, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Goethite, Interface, Investigations, Ions, IR, Isotherm, Isotherm Model, Kinetic, Kinetics, L1, Langmuir, Langmuir Model, Layered Double Hydroxides, Model, NOV, Oxide, pH, Phosphate, Phosphate Adsorption, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Randomness, Removal, Rights, Second Order, Second-Order, Solution, Thermodynamic, Thermodynamics, Vibration, Waste-Water, Water

? Liu, H.W., Dong, Y.H., Wang, H.Y. and Liu, Y. (2010), Ammonium adsorption from aqueous solutions by strawberry leaf powder: Equilibrium, kinetics and effects of coexisting ions. *Desalination*, **263** (1-3), 70-75.

Full Text: [2010\Desalination263, 70.pdf](2010/Desalination263,%2070.pdf)

Abstract: The batch experiments were performed to study the equilibrium and kinetics of ammonium adsorption from aqueous solution by strawberry (*Fragaia ananassa*) leaf powder, a novel bioadsorbent. The effects of pH and strength of coexisting cations and anions were also investigated. The equilibrium data were found to fit well to both the Langmuir Model and Freundlich Model, and the maximum adsorption capacities were 3.93, 6.05 and 7.66 mg/g at 15, 25 and 35ºC. respectively. The increase of temperature was favorable to ammonium adsorption. Kinetics study suggested that the intraparticle diffusion was the rate-controlling step of ammonium adsorption by strawberry leaf powder. The optimum pH for ammonium adsorption was in the range of 5-8. Individual presence of the K+ Na+, Ca2+, Mg2+, Cl-, NO3- or SO42- had no significantly effect on ammonium adsorption, indicating the selectivity of ammonium adsorption by strawberry leaf powder. FTIR analysis indicated that the hydroxyl, phenol and carboxyl groups might be the main active groups for ammonium adsorption. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Capacities, Ammonia Nitrogen, Ammonium, Analysis, Anions, Aqueous Solution, Aqueous Solutions, Batch, Batch Experiments, Bioadsorbent, Biosorbent, Biosorption, Clinoptilolite, Coexisting Ion, Data, Diffusion, Equilibrium, Exchange, Experiments, Freundlich, Ftir, Ftir Analysis, Intraparticle Diffusion, Ions, Isotherm, Kinetics, Langmuir, Model, Na+, NOV, pH, Phenol, Phosphate, Removal, Rights, Selectivity, Solution, Solutions, Strength, Temperature, Zeolite

? Zhang, Z.L., Xu, X.H. and Yan, Y.S. (2010), Kinetic and thermodynamic analysis of selective adsorption of Cs(I) by a novel surface whisker-supported ion-imprinted polymer. *Desalination*, **263** (1-3), 97-106.

Full Text: [2010\Desalination263, 97.pdf](2010/Desalination263,%2097.pdf)

Abstract: The surface ion-imprinting concept and chitosan incorporated sol-gel process were applied to the synthesis of a new whisker-supported polymer for selective separation of Cs(I) from aqueous solution. The prepared polymer was characterized with Fourier transform infra-red spectroscopy and X-ray diffraction, and then it was used in the sorption-desorption process. The effect of pH, the sorption rate and the mass of sorbent on the sorption capacity of imprinted polymer were studied. Results showed that sorption equilibrium time was achieved in about 2 h and the kinetic study showed to be well followed the pseudo-second-order kinetic equation in the adsorption process. At the same time, the adsorption isotherms studies indicated that Langmuir isotherm equation for the monolayer adsorption process was fitted well in the adsorption process and the maximum adsorption capacity was 32.9 mg g-1. Selectivity experiments showed that adsorbed amount of Cs(I) ion onto Cs(I) ion-imprinted polymer was higher than all other studied ions and the relative selectivity coefficient (K’) were all greater than 9. The developed method with precision relative standard deviation 1.26% and detection limit (3 sigma) 0.180 mu g L-1, respectively, using inductively coupled plasma atomic emission spectrometry was successfully applied to the determination of trace cesium in different water samples with satisfactory results. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Capacity, Adsorption Isotherms, Analysis, Aqueous Solution, Aqueous-Solution, Atomic-Absorption-Spectrometry, Capacity, Cesium, Chitosan, Cross-Linked Chitosan, Cs(I), Emission, Equilibrium, Experiments, Inductively Coupled Plasma, Infrared Spectroscopy, Ions, Isotherm, Isotherms, Kinetic, Kinetic Equation, Kinetic Study, L1, Langmuir, Langmuir Isotherm, Metal-Ions, Monolayer, Multiwalled Carbon Nanotubes, Nov, pH, Plasma, Polymer, Precision, Preconcentration, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Equation, Renewable Microcolumn, Rights, Selective Adsorption, Selective Separation, Selectivity, Separation, Sol-Gel, Sol-Gel Process, Sol-Gel Technology, Solid-Phase Extraction, Solution, Sorbent, Sorption, Sorption Capacity, Sorption Equilibrium, Sorption-Desorption, Spectrometry, Spectroscopy, Standard, Surface, Surface Ion-Imprinting, Synthesis, Thermodynamic, Trace-Metals, Water, Water Samples, X-Ray, X-Ray Diffraction

? Kołodyńska, D. (2010), The effects of the treatment conditions on metal ions removal in the presence of complexing agents of a new generation. *Desalination*, **263** (1-3), 159-169.

Full Text: [2010\Desalination263, 159.pdf](2010/Desalination263,%20159.pdf)

Abstract: The sorption of Cu(II), Zn(II), Ni(II), Cd(II) and Pb(II) ions in the presence of chelating agents of a new generation was carried out to investigate the sorption characteristics of Dowex M 4195. Influence of type and stability of sorbed complexes, sorption time, initial concentration, pH, temperature and the presence of interfering ions was estimated. For the two new biodegradable complexing agents: GLDA (tetrasodium salt of N,N-bis(carboxylmethyl)-L-glutamic acid) and EDDS (ethylenediaminedisuccinic acid) the mechanism of the sorption process was also proposed. The investigations in the single component system were conducted in the initial concentration range from 7.5×10-4 to 2.5×10-2 mol/L The pH varied from 2.0 to 12.0, whereas temperature changed from 303 to 333 K. The adsorption data were fitted to the Langmuir, Freundlich, Temkin and Dubinin-Raduschevich models. The experimental results show that Dowex M 4195 has higher sorption capacity for heavy metal ions in the presence of EDDS than GLDA. The results also indicate that the Langmuir adsorption model was able to adequately describe the sorption of Cu(II), Zn(II), Ni(II), Cd(II) and Pb(II) ions on Dowex M 4195. The sorption followed the pseudo second order sorption kinetics. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Capacity, Cd(II), Characteristics, Chelating Resins, Cobalt, Complexing Agents, Concentration, Cu(II), Data, Dowex M 4195, EDD, EDDS, Experimental, Freundlich, Generation, GLDA, Heavy Metal, Heavy Metal Ions, Heavy-Metals, Investigations, Ions, Kinetics, Langmuir, Mechanism, Metal, Metal Ions, Metal Ions Removal, Model, Models, Ni(II), Nickel, NOV, Pb(II), Pb(II) Ions, pH, Polymeric Ligand Exchanger, Pseudo Second Order, Pseudo-Second-Order, Removal, Resin Dowex M-4195, Rights, Salt, Second Order, Second-Order, Selective Sorption, Sorption, Sorption Capacity, Sorption Kinetics, Sorption Process, Stability, Temkin, Temperature, Treatment, Water, Zn(II)

? Zheng, Y.A., Hua, S.B. and Wang, A.Q. (2010), Adsorption behavior of Cu2+ from aqueous solutions onto starch-g-poly (acrylic acid)/sodium humate hydrogels. *Desalination*, **263** (1-3), 170-175.

Full Text: [2010\Desalination263, 170.pdf](2010/Desalination263,%20170.pdf)

Abstract: A series of starch-g-poly(acrylic acid)/sodium humate (St-g-PAA/SH) hydrogels were prepared and used to adsorb Cu2+ from the aqueous solution. The batch adsorption experiments were carried out by varying contact times (0-90 min), initial Cu2+ concentration (0.003-0.02 mol/L), and pH values (2.0-5.0). The effects of ion strength (5, 10 mmol/L NaCl) and competitive ion (5.10 mmol/L Pb(NO3)2) on the adsorption capacity were investigated. The results indicated that the addition of 5% SH into St-g-PAA polymeric networks could not only improve the initial adsorption rate and final adsorption capacity for Cu2+, but also make a remarkable contribution to regeneration ability. St-g-PAA/SH hydrogels exhibited high adsorption capacity within a wide pH range and the adsorption data could be well described by the pseudo-second-order kinetic model and Langmuir isotherm model. FTIR spectra before and after adsorption of Cu2+ on the hydrogels revealed that complexation was considered as the main adsorption mechanism. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Adsorption Capacity, Adsorption Mechanism, Adsorption Rate, Aqueous Solution, Aqueous Solutions, Batch, Batch Adsorption, Behavior, Capacity, Cellulose-Based Hydrogels, Chitosan, Competitive, Complexation, Concentration, Cu2+, Cu2+ Adsorption, Data, Dye Removal, Experiments, FTIR, FTIR Spectra, Graft-Polymerization, Humic-Acid, Hydrogel, Hydrogels, Ion Strength, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Mechanism, Model, NaCl, Networks, NOV, pH, Polymeric, Property, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Regeneration, Rights, Sodium Humate, Sodium Humate, Solution, Solutions, Starch, Strength, Superabsorbent Composite, Waste-Water

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Full Text: [2010\Desalination263, 189.pdf](2010/Desalination263,%20189.pdf)

Abstract: Fluoride in drinking water plays a dual role, beneficial or detrimental depending on its concentration and total amount consumed. The fluoride contamination in drinking water is perhaps the most common drinking water related problem which becomes a global problem and widely spreads worldwide. Adsorption-based defluoridation systems are well known as the best feasible option. The endeavor of the present work is to investigate the defluoridation by three effective adsorbents, developed from minerals and used tea leaves carbon. On the whole the proposed treatment method relies on adsorptive phenomenon for defluoridation in water reclamation process. Effects of pH, adsorbent dose, contact time, temperature and initial fluoride ion concentration were evaluated. To understand the pivotal role of developed materials, evaluation of best optimized conditions for kinetics, thermodynamics and isotherm modeling has been explored for decontamination processes and assess their characteristics along the processes. The data were fitted by different kinetics model viz. pseudo first-order, second-order, Elovich and Ritchie. Langmuir isotherm was applied to evaluate the adsorption capacity. Linear correlation regression coefficient R-2 was used to judge the favorable kinetic and isotherm models for adsorption. Adsorbents were characterized by scanning electron microscope, energy dispersive X-ray analysis and fourier transform infra red spectroscopy. Ecotoxicological assessment of developed material was carried out on adult freshwater teleosts Poecilia reticulata (Guppy fish) for its safe disposal of SACS. Expected outcome of this research work provides a barrier against the release of fluorides into waters thus improve water quality for human consumption. Pseudo second-order kinetic model was found to be most suitable for all the three adsorbents. Langmuir was a better fitting model in AdAA but Freundlich isotherm had a better fitting model for AdTC and SACS than the Langmuir. Silver impregnated-alumina-carbon-sand (SACS) was found most suitable among the studied adsorbents having adsorption capacity of 71.43 mg/g. Thermodynamics study reveals the endothermic nature of the adsorption. Significant details the obtained from the IR analysis, which also support the defluoridation by the possible groups/ions found on the surface of the adsorbents. The developed adsorbents were found effective for defluoridation from lower to higher concentration range of fluoride ion. The adsorbents can be disposed safely after their use. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption Capacity, Adult, Alumina, Analysis, Aqueous-Solution, Assessment, Barrier, Capacity, Carbon, Characteristics, Concentration, Consumption, Contamination, Correlation, Data, Decontamination, Defluoridation, Disposal, Drinking Water, Drinking-Water, Elovich, Endothermic, Energy, Equilibrium, Evaluation, First Order, Fish, Fluoride, Fluoride Ion, Fluoride Removal, Fluorides, Freshwater, Freundlich, Freundlich Isotherm, Human, Intraparticle Diffusion, Investigation, IR, Isotherm, Isotherm Modeling, Isotherm Models, Kinetic, Kinetic and Isotherm Models, Kinetic Model, Kinetics, Kinetics Model, Langmuir, Langmuir Isotherm, Metal-Ions, Minerals, Model, Modeling, Models, Natural, NOV, Outcome, Oxide, pH, Plant, Pseudo First Order, Pseudo First-Order, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Purification, Quality, Reclamation, Regression, Release, Research, Research Work, Rights, Role, Safety Evaluation, Second Order, Second-Order, Sorption, Spectroscopy, Support, Surface, Systems, Temperature, Thermodynamics, Treatment, Water, Water Quality, Water-Quality, Waters, Work, X-Ray

? Yusan, S. and Erenturk, S.A. (2010), Adsorption equilibrium and kinetics of U(VI) on beta type of akaganeite. *Desalination*, **263** (1-3), 233-239.

Full Text: [2010\Desalination263, 233.pdf](2010/Desalination263,%20233.pdf)

Abstract: The use of cheap, high efficiency and low-risk adsorbent has been studied for the removal of U(VI) from aqueous solutions. A series of experiments was conducted in a batch system to assess the effect of the system variables, i.e. initial pH, temperature, initial uranium concentration and contact time. The results of these parameters were given in the previous work. In this paper Langmuir, Freundlich, Temkin, Dubinin-Radushkevich (D-R) and Harkins-Jura isotherms were used to analyze the equilibrium data at different temperatures. Adsorption process fitted to Langmuir and Temkin isotherm models. Also the adsorption kinetics was found to follow pseudo-second-order rate kinetic model, with a good correlation (R-2>0.99) and intraparticle diffusion as one of the rate determining steps. The findings of this investigation suggest that the chemical sorption plays a role in controlling the sorption rate. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Equilibrium, Adsorption Equilibrium and Kinetics, Adsorption Kinetics, Alpha-Feooh, Aqueous Solutions, Aqueous-Solutions, As(V) Ions, Batch, Batch System, Beta-Feooh, Chemical, Concentration, Correlation, Data, Diffusion, Efficiency, Equilibrium, Experiments, Freundlich, Intraparticle Diffusion, Investigation, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Low Risk, Model, Models, NOV, Oxide Hydroxides, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Removal, Rights, Role, Solutions, Sorption, Synthetic Goethite, Temkin, Temkin Isotherm, Temperature, Thermodynamic Behavior, U(VI), Uranium, Work

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Full Text: [2010\Desalination263, 249.pdf](2010/Desalination263,%20249.pdf)

Abstract: Adsorptive removal of industrially important dyes namely, bromophenol blue, methylene blue and malachite green from aqueous media onto three novel adsorbents (C-0, C-2 and C-4) has been studied. The effect of different experimental parameters like contact time, concentration of cross-linking agent in the polymeric gel and temperature on adsorption of these dyes was investigated. Adsorption isotherms were found to be of L-type onto three adsorbents at both temperatures of 313 and 323 K. The experimental data for all the dyes on all adsorbents were applied to different adsorption isotherms (Freundlich, Langmuir and Temkin models) and pseudo-first order, pseudo-second order and intraparticle diffusion kinetics models. It was found that the adsorption of all the cases followed the pseudo-second order kinetics. The thermodynamic parameters such as change in free energy (ΔG), change in enthalpy (ΔH) and change in entropy (ΔS) were also calculated. The negative values of Delta G and Delta H indicated that the adsorption process for all the dyes on all adsorbents is spontaneous and exothermic, respectively. The adsorbent C-4 was found to be better for the removal of methylene blue and malachite green while C-0 for that of bromophenol blue. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Isotherms, Bagasse Fly-Ash, Color Removal, Concentration, Crosslinking, Data, Decolorization, Diffusion, Diffusion Kinetics, Dyes, Energy, Enthalpy, Entropy, Equilibrium Isotherm Analyses, Exothermic, Experimental, Freundlich, Gel, Intraparticle Diffusion, Isotherms, Kinetics, Kinetics and Thermodynamics, Kinetics Models, Kinetics of Adsorption, Langmuir, Langmuir Isotherm, Malachite Green, Malachite-Green, Media, Methylene Blue, Methylene-Blue, Models, NOV, Polymeric, Polymeric Gel, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Reactive Dye, Removal, Rights, Temkin, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water

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Full Text: [2010\Desalination264, 15.pdf](2010/Desalination264,%2015.pdf)

Abstract: In this investigation, we report the adsorption potential of alkoxide origin alumina for defluoridation of drinking water using batch and continuous mode of operations. The effects of different operating parameters such as adsorbent dose, initial fluoride concentration, pH of the solution and interfering ions (usually present in groundwater) were studied with a view to understand the adsorption behavior of the material under various conditions. A thermodynamic study shows that the adsorption of fluoride by alkoxide origin alumina is an exothermic and spontaneous process. The kinetic results showed that the fluoride sorption follows pseudo-second-order kinetics. The applicability of adsorbent in the field is also tested through column breakthrough studies. It has been observed that with an increase in the flow rate and initial fluoride concentration, the breakthrough curve becomes sharper and the breakthrough time and adsorbed fluoride ion concentration decrease. The breakthrough curve also becomes steeper as the bed height increases. The alkoxide origin alumina based adsorbent media can be used directly for field applications since it is also commercially available in granular form. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Alumina, Adsorbent, Adsorption, Alkoxide Alumina, Alumina, Applications, Batch, Breakthrough, Breakthrough Curve, Breakthrough Studies, Breakthrough Time, Column, Defluoridation, Drinking Water, Drinking-Water, Field, Fixed-Bed, Fluoride, Granules, Kinetic, Kinetic Modeling, Kinetics, Modified Chitosan, Operating Parameters, Performance, pH, Process, Pseudo Second Order, Pseudo-Second-Order, Removal, Sorption, Thermodynamic, Water

? Kizilkaya, B., Tekinay, A.A. and Dilgin, Y. (2010), Adsorption and removal of Cu(II) ions from aqueous solution using pretreated fish bones. *Desalination*, **264** (1-2), 37-47.

Full Text: [2010\Desalination264, 37.pdf](2010/Desalination264,%2037.pdf)

Abstract: Pretreated fish bones obtained from engraulis European anchovy (Engraulis encrasicolus), European anchovy (Sardine pilchardus), bogue (Boops boops), bluefish (Pomatomus saltatrix) and gilthead seabream (Sparus aurata) were used as natural, cost-effective, waste sorbents for the adsorption and removal of copper from aqueous systems. The removal efficiency of the adsorbent was investigated as a function of pH, contact time, initial metal concentration, temperature, cleaning process, fish species and adsorbent dose. The maximum adsorption capacity was 150.7 mg/g at optimum conditions. The kinetic results of adsorption obeyed a pseudo-second-order model. Copper adsorption fitted the Langmuir isotherm. ΔH° value was 12.9 kJ/mol indicating that the adsorption mechanism was endothermic. The activation energy, E-a, was determined as 52.9 kJ/mol. Weber-Morris and Urano-Tachikawa diffusion models were also applied to experimental equilibrium data. The fish bones were effectively used as a sorbent for the removal of Cu ions from aqueous solution. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Activation, Activation Energy, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Mechanism, Animal Bones, Biosorption, Capacity, Contact Time, Copper, Copper, Cu, Data, Diffusion, Equilibrium, Fish Bone, Hydroxyapatite, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Model, Models, Nickel(II) Ions, pH, Process, Pseudo Second Order, Pseudo-Second-Order, Removal, Removal Efficiency, Sorbent, Sorption, Temperature, Waste-Water

? Saad, S.A., Isa, K.M. and Bahari, R. (2010), Chemically modified sugarcane bagasse as a potentially low-cost biosorbent for dye removal. *Desalination*, **264** (1-2), 123-128.

Full Text: [2010\Desalination264, 123.pdf](2010/Desalination264,%20123.pdf)

Abstract: The use of adsorbent prepared from sugarcane bagasse, an agro waste from sugar industries has been studied as an alternative substitute for activated carbon for the removal of dyes from wastewater. Adsorbents prepared from sugarcane bagasse were successfully used to remove the methyl red (MR) from an aqueous solution in a batch reactor. This study investigates the potential use of sugarcane bagasse, pretreated with phosphoric acid (SBC), for the removal of methyl red from simulated wastewater. Phosphoric acid treated sugarcane bagasse was used to adsorb methyl red at varying dye concentration, adsorbent dosage, pH and contact time. A similar experiment was conducted with commercially available powdered activated carbon (PAC) and untreated sugarcane bagasse (SB) in order to evaluate the performance of SBC. The adsorption efficiency of different adsorbents was in the order PAC > SBC > SB. The initial pH 3 to 6 favoured the adsorption of synthetic dyes by both SBC and SB. This prepared adsorbent was very efficient in decolorized diluted solution. It is proposed that SBC, in a batch or stirred tank reactors could be employed as a low-cost alternative in wastewater treatment for dyes removal. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activated Carbon, Adsorbent, Adsorption, Adsorption, Aqueous-Solution, Aspergillus-Niger, Azo-Reactive Dyes, Congo Red, Dye Removal, Fly-Ash, Metal, pH, Removal, Simulated Wastewater, Solid-Waste, Sugarcane, Sugarcane Bagasse, Treatment, Wastewater, Wastewater Treatment, Water

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Full Text: [2010\Desalination264, 134.pdf](2010/Desalination264,%20134.pdf)

Abstract: In this paper, surface of novel biosorbent (Canola hull) was characterized and its dye removal ability at different cationic dye concentrations was studied. The isoelectric point, functional groups and morphology of Canola hull were investigated as biosorbent surface characteristics. Fourier transform infrared (FTIR), scanning electron microscopy (SEM) and UV-Vis spectrophotometry were used. Basic Blue 41, Basic Red 46 and Basic Violet 16 were used as model textile cationic dyes. The presence of functional groups onto Canola hull were investigated using FIR. The intraparticle diffusion, pseudo-first order and pseudo-second order kinetic models were examined to evaluate the kinetic data and the rate constants were calculated. The Langmuir, Freundlich and Tempkin adsorption isotherm models were applied to describe the equilibrium isotherms. Thermodynamic parameters such as free energy, enthalpy and entropy of dye adsorption were obtained. The FTIR spectrum proved the presence of functional groups such as hydroxyl and amino groups in adsorbent surface. Adsorption kinetic of dyes followed pseudo-second order kinetics. The thermodynamic studies showed that the dye adsorption onto Canola hull is spontaneous, endothermic and physical reaction. The results indicated that Canola hull could be used as a noval natural biosorbent for the removal of cationic dyes. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dyes, Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Adsorption Kinetic, Amino, Aqueous-Solutions, Basic-Dyes, Biosorbent, Canola Hull, Cationic, Characterization, Data, Diffusion, Dye, Dye Removal, Dyes, Equilibrium, Fourier Transform Infrared, Freundlich, FTIR, Immobilized Titania Nanophotocatalysis, Infrared, Intraparticle Diffusion, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Low-Cost Adsorbents, Methylene-Blue, Model, Models, Morphology, Novel Biosorbent, Photocatalytic Degradation, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, SEM, Surface Characterization, Textile, Textile Waste-Water, Thermodynamic, Thermodynamic Parameters

? Almeida, C.A.P., dos Santos, A., Jaerger, S., Debacher, N.A. and Hankins, N.P. (2010), Mineral waste from coal mining for removal of astrazon red dye from aqueous solutions. *Desalination*, **264** (3), 181-187.

Full Text: [2010\Desalination264, 181.pdf](2010/Desalination264,%20181.pdf)

Abstract: The use of mineral waste from coal mining (MWCM) as an adsorbent for the removal of astrazon red dye (AR) from aqueous solution was studied in detail Batch adsorption experiments were carried out under varied conditions such as different initial concentrations of AR contact time pH temperature and calcination of the adsorbent Investigations revealed that the maximum colour removal was observed for unbuffered solutions MWCM calculated at 400 C (MWCM400) was more efficient for dye removal than samples calculated at other temperatures The adsorption isotherm of AR on MWCM400 was determined and correlated with the Langmuir and Freundlich models the results indicated a better fit for the Langmuir model at all the temperatures studied Kinetic data were fitted with both pseudo first order and pseudo second-order kinetic models and the data were found to follow the latter model more adequately Calculated thermodynamic and kinetic parameters indicate a predominantly physisorption mechanism for the adsorption of AR onto MWCM400 The amount of AR adsorbed by MWCM400 per unit area was found to be two or three times greater than that by several comparable adsorbents (C) 2010 Elsevier B V All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Isotherm, Aqueous Solution, Aqueous Solutions, Astrazon Red Dye, Basic Dye, Batch Adsorption, Calcination, Coal, Coal Mining, Colour Removal, Crystal Violet, Data, Dye, Dye Removal, Equilibrium, Experiments, First, First Order, Freundlich, Isotherm, Kinetic, Kinetic Models, Kinetic Parameters, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Model, Mechanism, Metal-Ions, Methylene-Blue Removal, Mineral Waste, Mining, Model, Models, pH, Pseudo First Order, Pseudo Second Order, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Rights, Second Order, Second-Order, Si, Solution, Solutions, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Tree Fern, Waste, Water

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Full Text: [2011\Desalination265, 81.pdf](2011/Desalination265,%2081.pdf)

Abstract: Two modified hectorites have been designed and synthesized by two cationic surfactants namely cetyltrimethyl ammonium bromide (CTAB) and octadecylamine (ODA) for selective removal of the anionic dye congo red (CR) from aqueous solution. The adsorbent capacity of modified hectorites was discussed and the optical contents of CTAB and ODA were 35% and 28%, respectively. Modified hectorites were characterized by X-ray powder diffractometer (XRD), Fourier transform infrared (FTIR) spectroscopy and scanning electron microscopy (SEM). The effects of adsorbents content and adsorption temperature on the sorption of CR on modified hectorites were studied. Experimental results showed that the equilibrium adsorption data fitted well with the Langmuir isotherm and the adsorption capacities were 182 and 197 mg/g for the modified cetyltrimethyl ammonium bromide hectorite (CTAB-Hect) and ammonium bromide hectorite (ODA-Hect), respectively. Kinetic studies showed that the dynamical data fitted well with the pseudo-second-order kinetic model. For thermodynamic studies, parameters such as the Gibbs free energy (ΔG(0)), the enthalpy (ΔH-0) and the entropy (ΔS-0) indicated that the adsorption process was spontaneous and endothermic in nature. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Capacities, Alunite, Ammonium, Anionic Dye, Anionic Dyes, Aqueous Solution, Bentonite, Bromide, Capacity, Congo Red, Cr, CTAB, Data, Dye, Electron Microscopy, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, FTIR, Gibbs Free Energy, Isotherm, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Langmuir Isotherm, Model, Modified, Modified Hectorite, Pine Sawdust, Process Design, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Scanning Electron Microscopy, Selective Removal, SEM, Solution, Sorption, Spectroscopy, Surfactants, Temperature, Thermodynamic, Thermodynamic Studies, Thermodynamics, Water, X-Ray, XRD

? Kumar, R. and Ahmad, R. (2011), Biosorption of hazardous crystal violet dye from aqueous solution onto treated ginger waste (TGW). *Desalination*, **265** (1-3), 112-118.

Full Text: [2011\Desalination265, 112.pdf](2011/Desalination265,%20112.pdf)

Abstract: In this study, the biosorption characteristics of crystal violet (CV) from the aqueous solution onto treated ginger waste (TGW) were examined. The parameters studied were the effect of initial dye concentration, contact time, solution pH and temperature. The kinetic data obtained at different concentrations were analyzed using pseudo-first order, pseudo-second order and intra-particle diffusion models. The experimental data were fitted to Langmuir and Freundlich isotherms. The maximum monolayer biosorption capacity was found to be 64.93, 227.27 and 277.7 mg/g at 30, 40 and 50 degrees C, respectively. Thermodynamic parameters were evaluated and the positive value of ΔH-0 indicated endothermic nature of biosorption. The maximum breakthrough capacity was found to be 72.6 mg for 0.3 g TGW. Attempts were also made to regenerate the TGW using acetic acid as eluent. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous Solution, Biosorption, Biosorption Characteristics, Breakthrough, Capacity, Characteristics, Coir, Concentration, Crystal Violet, Data, Decolorization, Desorption, Diffusion, Dye, Endothermic, Equilibrium, Experimental, Freundlich, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherm, Isotherms, Kinetic, Kinetics, Kinetics, Langmuir, Langmuir and Freundlich Isotherms, Models, Monolayer, pH, Pith, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rights, Solution, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Value, Waste, Water

? Song, J.Y., Zou, W.H., Bian, Y.Y., Su, F.Y. and Han, R.P. (2011), Adsorption characteristics of methylene blue by peanut husk in batch and column modes. *Desalination*, **265** (1-3), 119-125.

Full Text: [2011\Desalination265, 119.pdf](2011/Desalination265,%20119.pdf)

Abstract: This study described adsorption of methylene blue (MB) by peanut husk in batch and fixed-bed column modes at 293 K. The kinetic and equilibrium of adsorption in batch mode were studied. Nonlinear regressive method was used to obtain relative parameters of adsorption models. The kinetic process was better described by a pseudo-second-order kinetic model. The equilibrium adsorption was effectively described by Temkin adsorption isotherm. The value of q(m) from the Langmuir model was 72.13±3.03 mg g(-1) and the diffusion coefficient value was in the order of 10(-8) CM2 s(-1). In fixed-bed column adsorption, the effects of bed height, feed flow rate, and inlet MB concentration were studied by assessing breakthrough curve. The column data were fitted by the Thomas, Clark and modified dose-response models. The modified dose-response model was best to fit the breakthrough curves at experimental conditions. FITR analysis showed that there were carbonyl and hydroxyl groups on the surface of the adsorbent. The results were implied that peanut husk may be suitable as an adsorbent material for adsorption of MB from an aqueous solution. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Isotherm, Analysis, Aqueous Solution, Aqueous-Solution, Assessing, Batch, Batch Mode, Biosorption, Breakthrough, Breakthrough Curve, Breakthrough Curves, Characteristics, Column, Column Modes, Concentration, Data, Diffusion, Diffusion Coefficient, Dye Removal, Equilibrium, Experimental, Feed, Fixed Bed, Fixed-Bed Column, Fixed-Bed Column, Flow, Flow Rate, Heavy-Metals, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Model, Low-Cost Adsorbents, MB, Methylene Blue, Mode, Model, Models, Modified, Peanut Husk, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Rice Husk, Rights, Solution, Surface, Treatment Technologies, Value, Waste-Water

? Witek-Krowiak, A., Szafran, R.G. and Modelski, S. (2011), Biosorption of heavy metals from aqueous solutions onto peanut shell as a low-cost biosorbent. *Desalination*, **265** (1-3), 126-134.

Full Text: [2011\Desalination265, 126.pdf](2011/Desalination265,%20126.pdf)

Abstract: Biosorption of Cu(II) and Cr(III) ions from aqueous solutions by peanut shell biomass was investigated as a function of initial pH, initial biomass concentration and temperature. The optimum sorption conditions were studied for each metal separately. The kinetics and equilibrium of biosorption were examined in detail. Four kinetic models (pseudo-first order, pseudo-second order, power function equation, and Elovich model) were used to correlate the experimental data and to determine the kinetic parameters. Four well-known adsorption isotherms were chosen to describe the biosorption equilibrium. The experimental data were analyzed using two two-parameter models (Langmuir and Freundlich) and two three-parameter models (Redlich-Peterson and Sips). The equilibrium biosorption isotherms showed that peanut shells possess high affinity and sorption capacity for Cu(II) and Cr(III) ions, with monolayer sorption capacities of 25.39 mg Cu2+ and 27.86 mg Cr3+ per 1 g biomass, respectively. All results showed that peanut shells biomass is an attractive, alternative low-cost biosorbent for removal of heavy metal ions from aqueous media. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Alternative, Aqueous Solutions, Biomass, Biosorbent, Biosorption, Biosorption Isotherms, Cadmium, Capacity, Chromium, Concentration, Copper Biosorption, Cr(III), Cr(III) Ions, Cu(II), Cu2+, Data, Elovich, Elovich Model, Equilibrium, Experimental, Freundlich, Function, Heavy Metal, Heavy Metal Ions, Heavy Metals, Ions, Isotherms, Kinetic, Kinetic Models, Kinetic Parameters, Kinetics, Langmuir, Low Cost, Low Cost Sorbent, Mechanism, Media, Metal, Metal Ions, Metals, Model, Models, Monolayer, pH, Power, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Redlich-Peterson, Removal, Rights, Solutions, Sorption, Sorption Capacity, Temperature, Waste, Water Treatment

? Chowdhury, S., Mishra, R., Saha, P. and Kushwaha, P. (2011), Adsorption thermodynamics, kinetics and isosteric heat of adsorption of malachite green onto chemically modified rice husk. *Desalination*, **265** (1-3), 159-168.

Full Text: [2011\Desalination265, 159.pdf](2011/Desalination265,%20159.pdf)

Abstract: Rice husk treated with NaOH was tested as a low cost adsorbent for the removal of malachite green from aqueous solution in batch adsorption procedure. The adsorption experiments were carried out as a function of solution pH, initial dye concentration, contact time and temperature. The adsorption was found to be strongly dependent on pH of the medium. The Freundlich isotherm model showed good fit to the equilibrium adsorption data. The mean free energy (E) estimated from the Dubinin-Radushkevich model indicated that the main mechanism governing the sorption process was chemical ion-exchange. The kinetics of adsorption followed the pseudo-second-order model and the rate constant increased with increase in temperature indicating endothermic nature of adsorption. The Arrhenius and Eyring equations were used to obtain the activation parameters such as activation energy (E-a), and enthalpy (ΔH-#), entropy (ΔS-#) and free energy (ΔG(#)) of activation for the adsorption system. Thermodynamic studies suggested the spontaneous and endothermic nature of adsorption of malachite green by treated rice husk. The isosteric heat of adsorption (ΔH-x) was also determined from the equilibrium information using the Clausius-Clapeyron equation. ΔH-x increased with increase in surface loading indicating some lateral interactions between the adsorbed dye molecules. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Activation, Activation Energy, Activation Parameters, Adsorbent, Adsorbents, Adsorption, Adsorption Thermodynamics, Aqueous Solution, Aqueous-Solution, Bagasse Fly-Ash, Basic-Dyes, Batch, Batch Adsorption, Chemical, Concentration, Cost, Data, Dye, Dye Removal, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Experiments, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Function, Heat of Adsorption, Information, Ion Exchange, Ion-Exchange, Ionexchange, Isosteric Heat of Adsorption, Isotherm, Isotherm Model, Kinetics, Kinetics of Adsorption, Loading, Low Cost, Low Cost Adsorbent, Malachite Green, Mechanism, Model, Modified, NaOH, pH, Procedure, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rate Constant, Removal, Rice, Rice Husk, Rice-Husk, Rights, Solution, Sorption, Sorption Process, Surface, Tamarind Fruit Shell, Temperature, Thermodynamic, Thermodynamics, Waste-Water

? Shao, W.J., Chen, L.H., Lü, L.L. and Luo, F. (2011), Removal of lead (II) from aqueous solution by a new biosorption material by immobilizing Cyanex272 in cornstalks. *Desalination*, **265** (1-3), 177-183.

Full Text: [2011\Desalination265, 177.pdf](2011/Desalination265,%20177.pdf)

Abstract: Cornstalk, a cellulosic agricultural waste material, was loaded with extractant Cyanex272 after chemical modification and was utilized for removing lead ions from aqueous media in this study. The adsorbents were characterized by FTIR spectra in order to confirm that some functional groups were successfully introduced into the surface of cornstalk after chemical modification and Cyanex272 was successfully immobilized on cornstalk by solid-liquid grinding method. The effects of pH, contact time, initial concentration and the amount of dried adsorbent were studied in batch experiments. Several models were used to fit the experimental data and the results showed that the experimental data fitted best in the Langmuir-Freundlich model and pseudo-second order model. The maximum adsorption capacities of adsorbents obtained from Langmuir-Freundlich model were 24.65, 245.8, 251.9. 235.6, 274.5 and 276.6 mg g-1 by using CS (cornstalk), CCS (cornstalk modified with 1 mol L-1 citric acid), SCCS (CCS modified with 0.1 mol L-1 NaOH solution), 272CS (cornstalk modified with Cyanex272), 272CCS (CCS modified with Cyanex272) and 272SCCS (SCCS modified with Cyanex272), respectively. Equilibrium time was shorten from 45 min for absorbents unloaded Cyanex272 to 30 min for those loaded with Cyanex272. Column experiment indicated that the breakthrough began at 136 BV by 272SCCS. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Capacities, Agricultural, Agricultural Waste, Alginate, Aqueous Solution, Batch, Batch Experiments, Biomass, Biosorption, Breakthrough, Cadmium(II), Cd(II), Chemical, Chemical Modification, Citric Acid, Column, Concentration, Cornstalk, Data, Effluents, Equilibrium, Experiment, Experimental, Experiments, Extraction, FTIR, FTIR Spectra, Functional Groups, Gel, Heavy-Metal Ions, Immobilized, Ions, Kinetics, Kinetics, L1, Langmuir-Freundlich, Lead, Media, Model, Models, Modification, Modified, NaOH, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Removal, Rights, Solution, Surface, Waste

? Basu, T. and Ghosh, U.C. (2011), Influence of groundwater occurring ions on the kinetics of As(III) adsorption reaction with synthetic nanostructured Fe(III)-Cr(III) mixed oxide. *Desalination*, **266** (1-3), 25-32.

Full Text: [2011\Desalination266, 25.pdf](2011/Desalination266,%2025.pdf)

Abstract: Nanoparticle (20-30 nm) agglomerates of synthetic hydrous Fe(III)-Cr(III) mixed oxide (NHICO) were used for As(III) adsorption from aqueous solutions. The parameters investigated were the effects of (i) incinerating temperature on NHICO and (II) solution pH. Kinetics of As(III) adsorption reaction with NHICO (incinerated at 350º C) was mainly investigated taking groundwater co-occurring ions at the background at optimum pH 7.0 (± 0.2). Results indicated that the NHICO incinerated at 350º C showed highest capacity of As(III) removal at pH 7.0 (± 0.2) from aqueous phases. The kinetic data of As(III) adsorption by NHICO described the pseudo-second order model very well. The capacities of As(III) removal (q(e)) obtained at equilibrium from experiments were found too close with the modeled values. Again, the q(e) values obtained in the presence of ions at background was found ranged in±5% of that in the absence of ion, excepting HCO3-. The q(e) value of As(III) in the presence of HCO3- was notably greater than that in the absence of any ion indicating increase of As(III) removal capacity by NHICO. Values of the rate constants increased with lowering As(III) concentrations. Therefore. NHICO incinerated at 350º C should be an efficient medium for filtrations of high As(III) contaminated groundwater. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Alumina, Adsorbent, Adsorption, Aqueous-Solution, Arsenic Removal, Arsenic(III), Contaminated Water, Equilibrium, Fe(III)-Cr(III) Mixed Oxide, Kinetics, Nanoscale Iron Particles, Nanostructure, Natural-Water, Sorption, Surface Speciation

? Wang, L., Zhang, J.P. and Wang, A.Q. (2011), Fast removal of methylene blue from aqueous solution by adsorption onto chitosan-g-poly (acrylic acid)/attapulgite composite. *Desalination*, **266** (1-3), 33-39.

Full Text: [2011\Desalination266, 33.pdf](2011/Desalination266,%2033.pdf)

Abstract: Batch adsorption experiments were carried out for the removal of methylene blue (MB) cationic dye from aqueous solution using chitosan-g-poly (acrylic acid)/attapulgite composites (CTS-g-PAA/APT) as adsorbent. The effects of attapulgite (APT) content, initial pH value of the dye solution and temperature on adsorption were investigated. Results showed that APT content of composites had some influence on adsorption capacities, and introducing a small amount of APT could improve adsorption capacity of chitosan-g-poly (acrylic acid) (CTS-g-PAA) to a certain extent. Results from kinetic experimental data showed that the adsorption rate of MB on CTS-g-PAA and CTS-g-PAA/APT with 30% of APT was fast, and more than 90% of the maximum adsorption capacities for MB were achieved within the initial 15 min. The adsorption behaviors of CTS-g-PAA and CTS-g-PAA/APT showed that the adsorption kinetics and isotherms were in good agreement with a pseudo-second-order equation and the Langmuir equation, and the maximum adsorption capacities reached 1873 and 1848 mg/g for CTS-g-PM and CTS-g-PAA/APT, respectively. The discussion results of the desorption studies implied that CTS-g-PAA and CTS-g-PAA/APT can be used as promising adsorbents for the removal of MB from wastewater. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activated Carbon, Adsorption, Agricultural Waste, Attapulgite, Brilliant-Green, Cationic Dyes, Chitosan, Composites, Fly-Ash, Kinetics, Langmuir, Methylene Blue, Sorption, Superabsorbent Composite, Textile Dyes, Water

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Full Text: [2011\Desalination266, 56.pdf](2011/Desalination266,%2056.pdf)

Abstract: A dried *Azolla filiculoides* (*A. filiculoides*) biomass was used to remove Basic Orange (BO) dye from aqueous solution using batch experiments. The kinetic results demonstrated that the biosorption of BO onto the dried *A. filiculoides* was well described by the pseudo-second-order kinetic model. The maximum biosorption capacity for BO was 833.33 mg/g based on the Langmuir equation at a temperature of 303 K, a solution pH of 7.0, a biosorbent dosage of 5 g/L and a contact time of 4 h. From the D-R isotherm equation, mean free energy was calculated to be 8.69 kJ/mol at 303 K, suggesting that the biosorption of BO onto the dried A. filiculoide involved chemisorption. The thermodynamic values, including ΔG, ΔH and ΔS obtained from the calculation, suggest that the biosorption of BO on the dried A. filiculoides biomass is feasible, spontaneous and endothermic under the experimental conditions in this study. Fourier transform infrared (FT-IR) spectroscopy was used to examine functional groups that may participate in the interaction between BO and dried A. filiculoides biomass. Results showed that the amino, carboxyl, and hydroxyl groups may be responsible for the biosorption of BO on the biomass. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: A.Filiculoides, Azolla-Filiculoides, Basic Orange (BO), Batch, Biosorption, Equilibrium, FT-IR, Kinetic Model, Kinetics, Langmuir, Methylene-Blue Adsorption, Parameters, Reactive Dyes, Remove Pb(II), Temperature, Textile Effluents, Waste-Water, Wood

? SenthilKumar, P., Ramalingam, S., Sathyaselvabala, V., Kirupha, S.D. and Sivanesan, S. (2011), Removal of copper(II) ions from aqueous solution by adsorption using cashew nut shell. *Desalination*, **266** (1-3), 63-71.

Full Text: [2011\Desalination266, 63.pdf](2011/Desalination266,%2063.pdf)

Abstract: In the present study, cashew nut shell(CNS) was investigated as a biosorbent for the removal of copper ions from aqueous solutions. Batch experiments were carried out to investigate the effect of solution pH, CNS concentration, contact time, initial copper(II) ion concentration and temperature on sorption efficiency. The copper adsorption was favored with maximum adsorption at pH 5.0. The percentage of copper ion removal onto the CNS was decreased with increasing temperature. Biosorption equilibrium time was observed in 30 min. The equilibrium adsorption data were fitted to Langmuir and Freundlich adsorption isotherm models and the model parameters were evaluated. The kinetics of copper(II) ion was discussed using four kinetic models, the pseudo-first-order, the pseudo-second-order, the Elovich kinetic model and the intra-particle diffusion models. It was shown that the adsorption of copper ions could be described by the pseudo-second order kinetic model. Thermodynamic quantities such as Gibbs free energy (ΔGº), the enthalpy (ΔHº) and the entropy change of sorption (ΔSº) have also been evaluated and it has been found that the sorption process was feasible, spontaneous and exothermic in nature. The results showed that CNS could be employed as a low-cost alternative adsorbent for the removal of copper ions from aqueous solutions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Biosorption, CNS, Copper(II) Ions, Cu(II), Equilibrium, Isotherm, Isotherms, Kinetic Model, Kinetics, Langmuir, Lead(II), Leaves Powder, Metal, Sawdust, Sorption, Thermodynamics, Waste

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Full Text: [2011\Desalination266, 72.pdf](2011/Desalination266,%2072.pdf)

Abstract: The montmorillonite/CoFe2O4 composite as a novel adsorbent with the magnetic separation performance was prepared by a facile, one-step low-temperature refluxing route. The structure, morphology and magnetic properties of the synthesized composite were characterized by powder X-ray diffractometer (XRD), scanning electron microscope (SEM) and vibrating sample magnetometer (VSM). Adsorption characteristics of the composite were examined by using methylene blue (MB) as an adsorbate. The effects of solution pH, dye concentration, contact time and temperature on the MB adsorption onto the composite were investigated. The results showed that the adsorption isotherm data were fitted well to the Langmuir isotherm. Adsorption kinetics of MB onto the composite followed the pseudo-second-order kinetic model. The thermodynamic parameters, such as ΔGº, ΔHº and ΔSº, were also determined and evaluated. Moreover, the composite adsorbent had high magnetic sensitivity under an external magnetic field, which allowed its magnetic separation from water avoiding the secondary pollution. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption, Adsorption Isotherm, Cationic Dyes, CoFe2O4, Composite, Fly-Ash, Kinetic Model, Kinetics, Langmuir, Methylene Blue, Montmorillonite, Na+-Montmorillonite, Red, Solid-Waste, Sorption, Water-Treatment

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Full Text: [2011\Desalination266, 93.pdf](2011/Desalination266,%2093.pdf)

Abstract: In this study, caustic red mud was neutralized using CO2 sequestration. Batch adsorption study was conducted to investigate the ability of activated CO2-neutralized red mud (ANRM) for the adsorption of Zn (II) ions from the aqueous solutions. The experiments were carried out with respect to adsorbent dose, pH, contact time, initial Zn(II) concentrations, kinetics, Langmuir and Freundlich isotherms. The characterization of CO2 neutralized red mud and mechanisms of Zn(II) adsorption on ANRM were studied by using TG-DSC, SEM/EDX, BET, AAS and chemical methods. Adsorption kinetic studies revealed that the adsorption process followed pseudo-second-order kinetics. The adsorption data were fitted to linearly transformed Langmuir isotherm with R-2 (correlation coefficient)>0.98. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Capacity, Cd, Clay, CO2, Cu, Ions, Kinetics, Langmuir, Langmuir Isotherm, Neutralization, Red Mud, Sorption, Waste, Zinc, Zinc Removal, Zn

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Full Text: [2011\Desalination266, 175.pdf](2011/Desalination266,%20175.pdf)

Abstract: Mn-modified activated carbon (PLAC-Mn) was prepared by impregnating Polygonum orientale Linn activated carbon (PLAC) with a MnNO3 solution. The feasibility of both PLAC and PLAC-Mn to remove 2,4-dichlorophenol (2,4-DCP) from an aqueous solution was examined. The absorbents were characterized by BET, XRD, FTIR and Boehm titration analysis. The influence of different parameters such as contact time, temperature, pH and ionic strength has been carried out. Property studies showed that impregnation with MnNO3 altered the structure of PLAC and Mn oxide was formed on the surface of PLAC-Mn. The 2,4-DCP adsorption capacity of PLAC-Mn was higher as compared to plain PLAC. The adsorption kinetic followed the pseudo-second-order equation for both adsorbents. The equilibrium data of PLAC was found to best fit to the Langmuir model, while PLAC-Mn was best explained by the Freundlich model. The adsorption of 2,4-DCP on both adsorbents decreased with an increase in pH. The ionic strength and desorption studies confirmed a chemical sorption mechanism. Crown Copyright (C) 2010 Published by Elsevier B.V. All rights reserved.

Keywords: 2,4-Dcp, 2,4-Dichlorophenol, Adsorption, Aqueous-Solutions, Chlorophenols, Congo-Red, Impregnated Activated Carbon, Ionic Strength, Langmuir, Oxidation, pH, Phenol, Pith Carbon, Polygonum Orientale Linn, Removal, Sorption, Thermodynamics, Waste-Water

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Full Text: [2011\Desalination266, 188.pdf](2011/Desalination266,%20188.pdf)

Abstract: A composite PANI/HA was prepared by adding humic acid (HA) into the chemical polymerization process of aniline monomers. Hg(II) ions and Cr(VI) anions were selected to evaluate the adsorption properties of PANI/HA, and the adsorption data were analyzed. Various factors affecting the uptake behavior such as aqueous pH, adsorbent concentration, ionic strength and competing anions were also studied. The adsorption kinetics followed the mechanism of the pseudo-second-order equation, and the maximum Hg (II) adsorption capacity calculated by Langmuir model was 671 mg g(-1), while the adsorption of Cr(VI) fitted well by Freundlich isotherm. Both ionic strength and certain competing anions had a significant effect on Hg (II) and Cr(VI) adsorption. BET analysis, FTIR spectra and transmission electron microscopy (TEM) were used to investigate the differences between polyaniline (PANI) and PANI/HA. The HA played an important role in modifying the morphology, preventing the aggregation of PANI, and improving the uptake properties of mercury and chromium on this composite in pH 3.0-7.0. The mechanism of Hg(II) and Cr(VI) adsorption was discussed. Crown Copyright (C) 2010 Published by Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Chromium, Chromium, Heavy-Metals, Humic-Acid, Ions, Kinetics, Langmuir, Mechanism, Mercury, Mercury, Nanoparticles, Pani, Ha Composite, pH, Recovery, Removal, Waste-Water

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Full Text: [2011\Desalination266, 231.pdf](2011/Desalination266,%20231.pdf)

Abstract: This study was to investigate granular activated carbon (GAC) adsorption of two algal odorants in water, dimethyl trisulfide and beta-cyclocitral. Among the four isotherm models (Langmuir, Freundlich, Temkin, and Dubinin-Radushkevich), Freundlich isotherm showed the best fitting with the equilibrium data in terms of the coefficient of determination (R-2) and Chi-square (chi(2)). Based on the parameters determined in the Freundlich isotherm equations for GAC adsorption of a single odorant, we successfully predicted the GAC adsorption behavior in a bisolute solution using the Ideal Solution Adsorption (IAS) model. In the kinetics study of the two odorants adsorption by GAC, pseudo first-order and pseudo second-order kinetic models both well fit the experimental data. The calculated Gibbs free-energy changes for GAC adsorption of dimethyl trisulfide and beta-cyclocitral were -3.61 and -4.24 kJ/mol at 298 K. respectively. The pH effects on GAC adsorption of dimethyl trisulfide and beta-cyclocitral were different. Alkaline condition (pH >10) favored GAC adsorption of dimethyl trisulfide, however, adsorption of the beta-cyclocitral was not significantly influenced by pH (2-13). The presence of natural organic matter (NOM) hindered adsorption of dimethyl trisulfide and beta-cyclocitral to differentº. Low molecular weight NOM fractions (particularly <1000) showed the significant inhibiting effect in the GAC adsorption. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: 2-Methylisoborneol, Adsorption, Adsorption Isotherms, Aquaculture, Beta-Cyclocitral, Cyanobacterial, Dimethyl Trisulfide, Drinking-Water, Equilibrium, Freundlich, Geosmin, Granular Activated Carbon (GAC), Kinetics, Langmuir, Metabolites, Microcystis, Natural Organic Matter (NOM), pH, Removal

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Full Text: [2011\Desalination266, 274.pdf](2011/Desalination266,%20274.pdf)

Abstract: This study investigated the potential use of a low-cost inorganic powder (Persian Kaolin) for removal of Basic Yellow 28 (BY28), Methylene Blue (MB) and Malachite Green (MG) from aqueous solution. Kaolin was characterized via a laser particle size analyzer (PSA), scanning electron microscope (SEM), X-ray diffraction (XRD) and X-ray fluorescence (XRF) techniques. The effect of adsorbent dosage, dye concentration, initial pH and the presence of various electrolytes was studied. The isotherm data of dyes were correlated reasonably well by the Langmuir adsorption isotherm. The values of the adsorption capacity of kaolin towards the cationic dyes ranged from 16 mg/g to 52 mg/g, being probably dependent on the geometry of the dye molecules. The resultingº of dye removal were 65-99% for initial dye concentration of 10 mg/L and for kaolin loadings of 0.8-2.5 g/L It was found that the adsorption of dyes on kaolin followed a pseudo-second order equation. The recovery and reuse of kaolin for a second and third time have also been studied. The thermodynamic studies showed that the dye adsorption onto kaolin is a spontaneous, endothermic and a physical reaction. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Isotherm, Advanced Oxidation Processes, Aqueous Solution, Aqueous-Solutions, Azo-Dye, Basic-Dyes, Basic-Yellow-28, Cationic Dye, Dye, Dye Adsorption, Dye Removal, Dyes, Isotherm, Kaolin, Kinetic, Langmuir, Langmuir Adsorption Isotherm, Malachite Green, Methylene Blue, Mg, pH, Recovery, Removal, SEM, Sorption, Technologies, Textile Dyes, Thermodynamic, Waste-Water, X-Ray Diffraction

? Yue, D.Y., Jing, Y., Ma, J., Xia, C.L., Yin, X.J. and Jia, Y.Z. (2011), Removal of Neutral Red from aqueous solution by using modified hectorite. *Desalination*, **267** (1), 9-15.

Full Text: [2011\Desalination267, 9.pdf](2011/Desalination267,%209.pdf)

Abstract: The object of this work was to study the modified hectorite as effective adsorbent for Neutral Red (NR) from aqueous solution. The adsorbent capacity of modified hectorite was discussed. The effects of surfactant content, adsorbent content, pH and adsorption temperature on the sorption of NR on modified hectorite were studied. Experimental results showed that the equilibrium adsorption data fitted well with Langmuir isotherm and the adsorption capacity was 393.70 mg/g for the modified cetylpyridinium bromide hectorite (CPB-Hect). Kinetic studies showed that the dynamical data fitted well with the pseudo-second-order kinetic model. For thermodynamic studies, parameters such as the Gibbs free energy (ΔGº), the enthalpy (ΔHº) and the entropy (ΔSº) indicated that the adsorption process was spontaneous and endothermic in nature. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Aqueous Solution, Basic Dye, Bromide, Capacity, Congo-Red, Data, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Gibbs Free Energy, Isotherm, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Langmuir Isotherm, Methylene-Blue, Model, Modified, Modified Hectorite, Neutral Red, pH, Process Design, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rights, Solution, Sorption, Surfactant, Temperature, Thermodynamic, Thermodynamic Studies, Thermodynamics, Work

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Full Text: [2011\Desalination267, 25.pdf](2011/Desalination267,%2025.pdf)

Abstract: The mitigation of recalcitrant heavy metals in an economic fashion is still a headline issue even though various methodologies and techniques have been explored. In this present study, inexpensive and abundant Eucalyptus (Eucalyptus globulus) bark has been utilized for adsorbent development; AdsEbc for mitigation of Pb (II) and Cd (II) ions from aqueous phase successfully. AdsEbc showed promising adsorption capacity of 26.12 and 35.65 mg g-1 for Pb (II) and Cd (II) ions at pH 5 and 8, respectively, calculated by best fitted isotherm modeling. Thermodynamics results revealed the feasibility and endothermic nature of adsorption process. Langmuir, Freundlich, Langmuir-Freundlich (Sips), Redlich-Peterson (R-P) and Dubinin-Radushkevich (D-R) models were used for the mathematical description of the relationship between adsorbed and aqueous concentration of adsorbate on adsorbent surfaces at equilibrium. Spectroscopic examinations of adsorbent were carried out with scanning electron microscopy and Fourier transform infrared spectroscopy. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Aqueous Phase, Aqueous-Solutions, Bagasse Fly-Ash, Biosorption, Cadmium, Capacity, Carbon Nanotubes, Cd, Characterizations, Complexation, Concentration, Development, Economic, Electron Microscopy, Elovich, Endothermic, Equilibrium, Eucalyptus, Feasibility, Freundlich, Heavy Metals, Infrared Spectroscopy, Ions, Isotherm, Isotherm Modeling, Langmuir, Langmuir-Freundlich, Lead Adsorption, Liquid, Metals, Methodologies, Mitigation, Modeling, Models, Pb, pH, Pseudo Second-Order, Redlich-Peterson, Removal, Rights, Scanning Electron Microscopy, Sips, Spectroscopy, Sugar-Industry Waste, Surface, Surface Complexation, Surfaces, Techniques, Thermodynamics

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Full Text: [2011\Desalination267, 64.pdf](2011/Desalination267,%2064.pdf)

Abstract: In this paper, the removal of two anionic dyes from textile effluent in single and binary systems was investigated. Direct Red 23 and Acid Green 25 were used as anionic dyes. The surface characteristics of chitosan were investigated using Fourier transform infrared. The effects of operational parameters such as chitosan dosage, initial dye concentration, salt and pH on dye removal were studied. The isotherms of dye adsorption were investigated. It was found that the isotherm data of Direct Red 23 and Acid Green 25 in single and binary systems followed Tempkin isotherm. In addition adsorption kinetics of dyes was studied in single and binary systems and rate sorption was found to conform to pseudo-second order kinetics with a good correlation. Results indicated that chitosan could be used as a biosorbent to remove the anionic dyes from contaminated watercourses in both single and binary systems of pollutants. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activated Carbon, Adsorption, Adsorption Behavior, Adsorption Kinetics, Anionic Dye, Anionic Dyes, Aqueous-Solutions, Beads, Binary System, Biosorbent, Characteristics, Chitin, Chitosan, Colored Textile Wastewater, Concentration, Correlation, Data, Dye, Dye Adsorption, Dye Removal, Dyes, Immobilized Titania Nanophotocatalysis, Isotherm, Isotherms, Kinetics, Part I, pH, Pollutants, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Reactive Dye, Removal, Rights, Salt, Sorption, Surface, Systems, Textile Effluent, Textile Wastewater, Wastewater

? Deniz, F. and Saygideger, S.D. (2011), Removal of a hazardous azo dye (Basic Red 46) from aqueous solution by princess tree leaf. *Desalination*, **268** (1-3), 6-11.

Full Text: [2011\Desalination268, 6.pdf](2011/Desalination268,%206.pdf)

Abstract: Batch biosorption experiments were carried out for the removal of Basic Red 46 (BR 46) from aqueous solution by using princess tree leaf (PTL) as a potential biosorbent. The effects of solution pH, biosorbent dosage and size, dye concentration, temperature and contact time on the biosorption of BR 46 onto the PTL were investigated. The experimental results showed that maximum pH for efficient BR 46 biosorption was about 8.0. The equilibrium was attained in 70 min. The amount of BR 46 sorbed onto the PTL increased with the increase of dye concentration, in contrary, it decreased with increases of temperature, biosorbent dosage and size. The equilibrium sorption was best described by the Langmuir isotherm model. The maximum monolayer sorption capacity was found as 43.10 mg g(-1) at 25ºC. Kinetic studies indicated that the pseudo-second order model fitted to the experimental data well. Thermodynamic parameters demonstrated that the biosorption process was spontaneous and exothermic. The results revealed that the PTL could be used as a low-cost alternative biosorbent for the dye removal from wastewater. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Basic Red 46, Biosorption, Biosorption, Decolorization, Dye, Elovich Equation, Equilibrium, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Malachite-Green, Methylene-Blue, Parameters, Paulownia Tomentosa, pH, Princess Tree, Removal, Rhodamine-B, Thermodynamic, Wastewater

? Huang, L.H., Sun, Y.Y., Yang, T. and Li, L. (2011), Adsorption behavior of Ni (II) on lotus stalks derived active carbon by phosphoric acid activation. *Desalination*, **268** (1-3), 12-19.

Full Text: [2011\Desalination268, 12.pdf](2011/Desalination268,%2012.pdf)

Abstract: The adsorption behavior of Ni (II) on activated carbon prepared from lotus stalks by H3PO4 activation has been investigated. Scanning electron microscopy and BET surface area were characterized to provide insight into the properties of lotus stalks activated carbon (LSAC). The adsorbent prepared was found to have a porous structure with surface area of 1220 m2/g. Adsorption results revealed that the removal speed of Ni (II) by lotus stalks derived active carbon was rapid. The pseudo-second-order kinetic model fitted well with kinetic data. showing high determination coefficients (R2) of over 0.999. The adsorption isotherms of Ni (II) on this adsorbent were well described by Langmuir and the maximum adsorption capacity calculated from Langmuir isotherm model was up to 31.45 mg/g. The negative ΔG and the positive ΔH suggested the spontaneous and endothermic nature of the process. The effect of pH and ionic strength and desorption studies could help explain the electrostatic attraction and ion-exchange adsorption mechanism. Desorption studies also represented that LSAC had a good regeneration capacity. The results showed that LSAC could be used to effectively adsorb Ni (II) from aqueous solutions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Active Carbon, Adsorption, Adsorption Kinetics And Isotherms, Aqueous-Solutions, Cd(II), Cu(II), Desorption, Equilibrium, Ions, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Lotus Stalks, Nanotubes, Ni(II), pH, Removal, Waste-Water

? Chen, N., Zhang, Z.Y., Feng, C.P., Li, M.A., Chen, R.Z. and Sugiura, N. (2011), Investigations on the batch and fixed-bed column performance of fluoride adsorption by Kanuma mud. *Desalination*, **268** (1-3), 76-82.

Full Text: [2011\Desalination268, 76.pdf](2011/Desalination268,%2076.pdf)

Abstract: The removal of fluoride from water by Kanuma mud using batch and fixed-bed column adsorption techniques was investigated. In a batch study, maximum fluoride removal was achieved within the pH range 5.0-7.0, taking about 2 h to attain equilibrium. Equilibration time did not depend upon the initial fluoride concentration. Kinetics data were fitted with a pseudo-second-order model. The experimental data fitted well to a Freundlich adsorption isotherm. Fixed-bed column experiments were carried out for different influent fluoride concentrations, bed depths, and various flow rates. The breakthrough time and exhaustion time decreased with increasing flow rate, decreasing bed depth and increasing influent fluoride concentration. The bed depth service time model and the Thomas model were applied to the experimental results. Both model predictions were in good agreement with the experimental data for all the process parameters studied, indicating that the models were suitable for Kanuma mud fix-bed column design. Column adsorption was reversible and the regeneration operation was accomplished by pumping 0.1 M NaOH through the loaded Kanuma mud column. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Adsorption Kinetics, Aqueous-Solution, Biosorption, Chitosan Beads, Drinking-Water, Equilibrium, Feasibility Analysis, Fixed Bed, Fluoride Removal, Freundlich, Ion-Exchange, Kanuma Mud, Kinetics, pH, Red Mud, Regeneration, Removal, System, Thomas Model, Waste-Water

? Kamboh, M.A., Solangi, I.B., Sherazi, S.T.H. and Memon, S. (2011), A highly efficient calix[4]arene based resin for the removal of azo dyes. *Desalination*, **268** (1-3), 83-89.

Full Text: [2011\Desalination268, 83.pdf](2011/Desalination268,%2083.pdf)

Abstract: The present study presents the adsorption behavior of p-tert-butyl-calix[4]arene based silica resin (4) for reactive black-5 (RB-5) and reactive red-45 (RR-45) azo dyes. The batchwise adsorption study was carried out to optimize various experimental parameters such as the effect of adsorbent dosage, pH, electrolyte, contact time, temperature and dye concentration. The maximum adsorption of RB-5 and RR-45 was achieved at pH 9 and pH 3, respectively. The kinetic studies revealed that the adsorption process followed the pseudo-second-order kinetic model. The positive and negative values of ΔH and ΔG demonstrated that the nature of adsorption process was endothermic and spontaneous. The adsorption behavior was analyzed by Langmuir and Freundlich isotherms. The values of correlation coefficients (R-2) showed that the Freundlich isotherm model found to be best fit. Results of study showed that resin 4 proved to be highly effective for the removal of selected azo dyes. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Adsorption Kinetics, Aqueous-Solutions, Azo Dyes, Bacteria, Calixarene, Carcinogenicity, Dye, Dyes, Fly-Ash, Freundlich, Freundlich Isotherm, Kinetic Model, Langmuir, pH, Powdered Activated Carbon, Rb5, Reactive Dyes, Resin, Silica, Silica, Surface, Textile Effluent

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Full Text: [2011\Desalination268, 111.pdf](2011/Desalination268,%20111.pdf)

Abstract: In the paper the clay minerals of halloysite nanotubes (HNTs) were used as adsorbent to remove cationic dye, methyl violet (MV), from aqueous solution. The effects of contact time, initial concentration, adsorbent dose, initial pH, temperature and ionic strength were investigated. The adsorbent exhibited rapid adsorption rate and high adsorption capacity of 113.64 mg/g for MV. Batch kinetic experiments showed that the adsorption fitted pseudo-second-order kinetic model well with correlation coefficients greater than 0.999. The adsorption capacity of the adsorbent increased significantly with the increase of initial concentration, decreased with the increase of ionic strength, and varied little with pH. The equilibrium isotherm data were well described by the Langmuir model. Thermodynamic parameters of ΔG(0), ΔH-0 and ΔS-0 indicated the adsorption process was spontaneous and exothermic. The regeneration of HNTs could be realized by simple calcinations and the recovered HNTs could be used again for MV removal. Due to its low cost, high adsorption capacity, fast adsorption rate and simple regenerated method. HNTs could be used as an effective adsorbent for cationic dye removal. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Agricultural Waste, Blue, Clay Nanotubes, Controlled-Release, Dye, Equilibrium, Fly-Ash, Halloysite Nanotube, Kinetic Model, Kinetics, Langmuir, Mechanism, Methyl Violet, Natural Zeolite, pH, Removal, Thermodynamic

? Mahmoodi, N.M., Hayati, B., Arami, M. and Lan, C. (2011), Adsorption of textile dyes on Pine Cone from colored wastewater: Kinetic, equilibrium and thermodynamic studies. *Desalination*, **268** (1-3), 117-125.

Full Text: [2011\Desalination268, 117.pdf](2011/Desalination268,%20117.pdf)

Abstract: In this paper, the adsorption of Acid Black 26 (AB26), Acid Green 25 (AG25) and Acid Blue 7 (AB7) onto Pine Cone (PC) was investigated in aqueous solution. Surface study of PC was investigated using Fourier transform infrared (FTIR) and scanning electron microscopy (SEM). The effect of operational parameters such as adsorbent dosage, dye concentration, inorganic anion (salt), pH and temperature onto dye removal was studied. The intraparticle diffusion model, the pseudo-first order and the pseudo-second order were used to describe the kinetics data. Equilibrium isotherms were analyzed using Langmuir. Freundlich and Tempkin adsorption models. Thermodynamic parameters of dye adsorption were obtained. The experimental data fitted well to the pseudo-second order kinetics model for dyes. The results indicated that isotherm data of AB26 and AG25 followed Langmuir isotherm and isotherm data of AB7 followed Freundlich isotherm models. The thermodynamic data indicated that the adsorption was endothermic process. Dye desorption studies in aqueous solution at pH 12 showed that maximum desorption of 93%, 97% and 94.5% were achieved for AB26, AG25 and AB7, respectively. It can be concluded that PC could be effectively employed as an effective biosorbent for the removal of dyes. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dyes, Adsorbent, Adsorption, Aqueous-Solutions, Azo-Dye, Basic-Dyes, Decolorization, Dye, Dyes, Equilibrium, Freundlich, Freundlich Isotherm, Ftir, Fundamental Properties, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Orange Peel, pH, Pine Cone, Reactive Dyes, Removal, Tempkin, Textile Dyes, Thermodynamic, Wastewater

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Full Text: [2011\Desalination268, 150.pdf](2011/Desalination268,%20150.pdf)

Abstract: Moringa oleifera bark (MOB), an agricultural solid waste by-product has been developed into an effective and efficient biosorbent for the removal of Ni(II) from aqua solutions. The biosorbent was characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM), elemental analysis and FTIR analyses. The experimental equilibrium adsorption data were analyzed by four widely used two-parameter equations Langmuir, Freundlich, Dubinin-Radushkevich (D-R), and Temkin isotherms. Among the four isotherm models Langmuir model provided a better fit with the experimental data than others as revealed by high correlation coefficients, low chi-square values. The kinetics data fitted well into the pseudo-second-order model with correlation coefficient greater than 0.99. Desorption experiments were carried out to explore the feasibility of regenerating the biosorbent and the biosorbed Ni(II) from MOB was desorbed using 0.2 M HCl with an efficiency of 98.02% recovery. The thermodynamic parameters (ΔH, ΔS and ΔG) of the nickel ion uptake onto MOB indicated that, the process is endothermic and proceeds spontaneously. The findings of the present study indicates that MOB can be successfully used for separation of Ni(II) from aqueous solutions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Biomass, Biosorption, Cadmium, Desorption, Equilibrium, Freundlich, Ftir, Heavy-Metals, Ions, Isotherms, Kinetics, Langmuir, Moringa Oleifera Bark, Nickel, Pb(II), Removal, Separation, Sorption, Tea Factory Waste, Thermodynamic, Thermodynamics

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Full Text: [2011\Desalination268, 208.pdf](2011/Desalination268,%20208.pdf)

Abstract: Permanent hard water softening using oxidized carbon nanotube (CNT) sheets was performed. CNT sheets were synthesized by chemical vapor deposition of cyclohexanol and ferrocene in nitrogen atmosphere at 750 degrees C, and oxidized with concentrated nitric acid at room temperature and then employed as adsorbent for permanent hard water softening. Various isotherms and kinetic models were applied to fit the experimental data. It was found out that the adsorption behavior of hard mineral ions by oxidized CNT sheets match well with the Freundlich isotherm and the pseudo-second-order kinetic model. The results demonstrated that the oxidized CNT sheets can be used as an effective adsorbent for hard water softening due to their high adsorption capacity. Also, using the oxidized CNT sheets, hard water softening without CNT leakage into water is economically feasible. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Aqueous-Solution, Carbon Nanotube Sheets, Chemisorption, Freundlich, Freundlich Isotherm, Isotherms, Kinetic Model, Kinetic Models, Metal-Ions, Permanent Hard Water Softening, Removal, Sorbents, Zinc(II)

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Full Text: [2011\Desalination269, 17.pdf](2011/Desalination269,%2017.pdf)

Abstract: The sorption of copper(II) from sulphate medium on an extractant polymer containing phosphonic acid has been studied in batch mode. Since the extraction kinetics were fast, with a mixture of 0.01 g of extractant and 5 mL of copper(II) 31.75 mg/L solution, extraction equilibrium was reached within 20 min of mixing. The sorption process follows a pseudo-second-order kinetics. The influence of some parameters such as initial copper(II) ion concentration, initial pH of aqueous solution, ion strength and copper salt nature on the amounts of Cu(II) sorbed with the phosphonic acid polymer have been studied at fixed temperature (25 +/- 2 degrees C). The optimum pH value level for quantitative sorption was between 4.5 and 5.9. The sorption capacity of the phosphonic acid polymer is 85.69 mg/g. Adsorption equilibrium data were calculated for Langmuir and Freundlich isotherms. It was found that the sorption of Cu(II) was better suited to the Langmuir adsorption model than the Freundlich adsorption model. The effects of anions on Cu(II) sorption were dependent on anion types and were apparently related to the altered surface properties caused by anion adsorption and/or the formation of anion Copper(II) complexes. Regeneration of the new extractant was realized by washing in medium acidic media. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Bentonite, Copper(II), Cu(II), Equilibrium, Freundlich, Isotherms, Kinetics, Langmuir, Metal-Ions, Performance, pH, Phosphonic Acid, Regeneration, Removal, Resin, Schiffs Base, Separation, Solid-Phase Extraction, Sorption, Trace Amounts

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Full Text: [2011\Desalination269, 58.pdf](2011/Desalination269,%2058.pdf)

Abstract: The objective of this study was the examination of the ability of a synthetic goethite nanocrystal to remove hexavalent uranium from aqueous solutions under various conditions. Goethite (α-FeOOH), which has a strong affinity for adsorption of the uranyl (UO22+) ion, was synthesized in the laboratory and used as adsorbent. Batch studies have been carried by observing the effects of pH, temperature, concentration of the adsorbate, contact time. etc. Various sorption isotherm models like, Langmuir. Freundlich and Dubinin-Radushkevich have been carried out for the adsorbent. The sorption on the goethite has been found endothermic and feasible in nature. Various thermodynamic parameters, such as Gibb’s free energy, entropy and enthalpy of sorption process, have been calculated. Furthermore, the Lagergren first-order, pseudo-second-order and the intraparticle diffusion models were used to describe the kinetic data. The experimental data fitted well the pseudo-second-order kinetics. The product material was characterized by powder X-ray diffraction for crystalline phase identification, scanning electron microscope (SEM) and multi point Brunauer, Emmett and Teller (BET). (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Adsorption Kinetics, Aqueous-Solutions, Biosorption, Equilibrium, Freundlich, Heavy-Metals, Iron, Iron Oxides, Kinetics, Langmuir, pH, Phosphate Adsorption, Removal, Sorption, Surface Complexation Model, Synthetic Goethite, Thermodynamic, Uranium(VI), Water

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Full Text: [2011\Desalination269, 163.pdf](2011/Desalination269,%20163.pdf)

Abstract: Na-montmorillonite was modified via an ion-exchange reaction with octadecyl dihydroxy ethyl methylammonium bromide (ODEM). The modified material (Na-Mt) was characterized by X-ray diffraction (XRD), Fourier transform infrared (FUR) spectroscopy. and Scanning electron microscopy (SEM). The basal spacing of the modified Na-Mt was 2.47 nm and the IR spectra of modified Na-Mt showed CH2 vibrations. The adsorption of phenol by modified Na-Mt from aqueous solution was indicative of a pseudo-second-order model which was used to calculate the corresponding rate constants (2.07 g/mg min(-1) at 308 K), and the Langmuir isotherms fitted the adsorption best, giving the highest adsorption capacity (384.61 mg/g at 308 K). The calculated thermodynamic parameters suggested that the adsorption of phenol onto modified Na-Mt was physisorptive, spontaneous and exothermic in nature. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Bentonite, Clay, Contaminants, Equilibrium, Langmuir, Nitrophenol, Organomontmorillonite, Phenol, Removal, Sorption, Thermodynamic, Wastewater, Water, Wyoming Montmorillonite

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Full Text: [2011\Desalination269, 206.pdf](2011/Desalination269,%20206.pdf)

Abstract: Dissolved organic nitrogen (DON) is now considered as one of the most important issues in drinking water field. In this study, DON removal by using Al-pillared bentonite adsorption is studied. Adsorption kinetics, equilibrium isotherms and the effect of pH are investigated. The method based on pillared bentonite adsorption is proved to be effective in removing DON and related substances. The maximum adsorption capacities of the bentonites vary from 7.11 to 7.61 mg/g. Kinetic studies show that the adsorption of DON on the bentonites can be described by the pseudo-second-order kinetic model, and the intra-particle diffusion controls the limiting rate. pH is found to be the key parameter affecting DON removal. Acidic conditions are favored while alkaline conditions are impeded. Furthermore, it is found that the adsorption capacity of the pillared bentonites depends on the ratio of OH-/Al3+ during the pillaring process. Three-dimensional excitation-emission matrix (EEM) is also applied to assess the effect of adsorption on the removal of different DON fractions, and the results show that the tyrosine-like fractions are easier to be adsorbed. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Al-Pillared Bentonite, Aqueous-Solutions, Carbon, Concentrated Medium, Dissolved Organic Nitrogen, Drinking-Water, Equilibrium, Equilibrium Isotherms, Fe, Humic-Acid, Kinetic, Kinetic Model, Kinetics, Montmorillonite, Nitrosamines, P-Nitrophenol, pH, Removal

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Full Text: [2011\Desalination267, 139.pdf](2011/Desalination267,%20139.pdf)

Abstract: An activated carbon was prepared from the stalk of the scrap aquatic plant loosestrife, by H3PO4 activation and then was evaluated for its ability to adsorb 2,4,6-trichlorophenol (TCP). The effects of solution pH, agitation time, TCP initial concentration, and temperature on TCP adsorption were investigated. The equilibrium adsorption data of TCP on activated carbon were analyzed by Langmuir, Freundlich and Temkin isotherm models. The Temkin model gave the best correlation with the experimental data. The adsorption was found to follow the pseudo-second-order kinetics. The intraparticle diffusion model was used to determine the mechanism of the adsorption process. Thermodynamic parameters such as standard enthalpy (ΔHo), standard entropy (ΔSo), and standard free energy (ΔGo) were obtained. Adsorption of TCP is exothermic with ΔH-o at -12.87 kJ/mol. (c) 2010 Elsevier B.V. All rights reserved.

Keywords: 2,4,6-Trichlorophenol, 4-Chlorophenol, Activated Carbon, Adsorbent, Adsorption, Chlorophenols, Coconut Husk, Equilibrium, Equilibrium Isotherm, Freundlich, Hydrogen-Peroxide, Isotherm, Kinetics, Kinetics, Langmuir, Loosestrife Activated Carbon, Optimization, pH, Phenol, Removal, Response-Surface Methodology, Thermodynamic

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Full Text: [2011\Desalination267, 193.pdf](2011/Desalination267,%20193.pdf)

Abstract: The utilization of modified wheat residue (MwR) as sorbent to remove the anionic dye (Reactive Red-24, RR-24) from aqueous solution was studied. MWR was prepared and characterized by specific surface area, SEM, zeta potential, FTIR and elemental analysis. Sorption experiments were carried out as a function of sorbent dosage, pH, contact time and concentration of dye. Results indicated that a mass of amine groups were grafted into the framework of MWR. It was shown that pseudo-second-order kinetic equation could best describe the sorption kinetics. The equilibrium sorption data were well represented by the Langmuir isotherm equation. The maximum sorption capacity of MWR for RR-24 was 200.0 mg/g, which showed higher capacity than those of previous work and a similar capacity compared to those of commercial activated carbon. The results indicated that MWR could be employed as an excellent and low-cost sorbent for removal of anionic dye from aqueous solution. (c) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorption, Agricultural Waste, Aqueous-Solutions, Chitosan, Dye, Equilibrium, Equilibrium Isotherm, FTIR, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Modified Wheat Residue (Mwr), pH, Reactive Dyes, Sorption, Sorption, Textile Dye, Water

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Full Text: [2011\Desalination267, 256.pdf](2011/Desalination267,%20256.pdf)

Abstract: In this study, polyacrylamide was utilized as a potential adsorbent for the removal of textile dye methyl violet (MV). The optimum conditions for adsorption by using a batch method were evaluated by changing various parameters such as contact time, adsorbent dose, initial pH of the solution and temperature. The adsorption equilibrium was well described by the Langmuir isotherm model with maximum adsorption capacity of 1136 mg g-1 of methyl violet on polyacrylamide (PAA). The observed increase in adsorption with increasing temperature suggests that the adsorption of dye on polyacrylamide is endothermic in nature. Methyl violet adsorption followed pseudo-second-order rate kinetics. From kinetic studies, various rates and thermodynamic parameters such as enthalpy, free energy and entropy changes were calculated and these values show that the MV-PAA adsorption process was favored at high temperatures. (c) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activated Carbon, Adsorption, Anionic Dyes, Basic-Dyes, Cationic Dyes, Dye, Equilibrium, Factorial Design, Fixed-Bed, Fly-Ash, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Methyl Violet, pH, Polyacrylamide, Reactive Dyes, Thermodynamic, Thermodynamic Parameters, Waste-Water

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Full Text: [2011\Desalination267, 286.pdf](2011/Desalination267,%20286.pdf)

Abstract: The adsorptive properties of natural bentonite in the removal of zinc (Zn2+) from aqueous solution were studied. The results show that the amount of adsorption of zinc metal ion increases with initial metal ion concentration, contact time, and solution pH but decreases with the amount of adsorbent and temperature of the system. Kinetic experiments clearly indicate that adsorption of zinc metal ion (Zn2+) on bentonite is a two step process: a very rapid adsorption of zinc metal ion to the external surface is followed by possible slow decreasing intraparticle diffusion in the interior of the adsorbent which has also been confirmed by intraparticle diffusion model. Overall the kinetic studies showed that the zinc adsorption process followed pseudo-second-order kinetic model. The different kinetic parameters including rate constant, half adsorption time, and diffusion coefficient are determined at different physicochemical conditions. The equilibrium adsorption results are fitted better with Langmuir isotherm compared to Freundlich models. The value of separation factor, R-L from Langmuir equation and Freundlich constant, n both give an indication of favorable adsorption. Finally in thermodynamic studies, it has been found that the adsorption process is exothermic due to negative Δ*H*0 accompanied by a decrease in entropy change and Gibbs free energy change (Δ*G*0). (c) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Bentonite, Cadmium, Clay, Equilibrium, Fly-Ash, Freundlich, Heavy-Metals, Isotherm, Kaolinite, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, pH, Porous-Media, Removal, Separation, Sorption, Thermodynamic, Zinc Adsorption

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Full Text: [2011\Desalination270, 40.pdf](2011/Desalination270,%2040.pdf)

Abstract: The present paper aims to study the effectiveness of an abundant marine waste named *Posidonia oceanica* (*P. oceanica*) on ammonium removal from aqueous solutions under different experimental conditions. The results of this study have shown that ammonium biosorption onto *P. oceanica* fibers increases with initial ammonium concentrations and pH increase. Biosorption isothermal data were well fitted by Langmuir model suggesting a monolayer and uniform adsorption process. The kinetic modeling of the experimental data indicated that they were well described by a pseudo-second-order model predicting a chemisorption process. The scanning electron microscopy (SEM), the energy dispersive spectroscopy (EDS) and the Fourier transform Infra-red spectroscopy (FTIR) analysis before and after biosorption of ammonium onto *P. oceanica* revealed that the main involved mechanisms are both surface ion exchange with magnesium and calcium cations and surface or intraparticle sharing between ammonium and functional groups, such as O-H, N-H, C=O and C-H stretching, and N-H bending. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Ammonium, Batch, Biosorption, By-Product, Clinoptilolite, Electron Microscopy, Equilibrium, Exchange, FTIR, Kinetic, Langmuir, Mechanism, Natural Zeolite, P. oceanica Fibers, pH, Phosphate Ions, Removal, Sorption, Waste, Waste-Water Treatment

? Kebir, M., Chabani, M., Nasrallah, N., Bensmaili, A. and Trari, M. (2011), Coupling adsorption with photocatalysis process for the Cr(VI) removal. *Desalination*, **270** (1-3), 166-173.

Full Text: [2011\Desalination270, 166.pdf](2011/Desalination270,%20166.pdf)

Abstract: The adsorption of Cr(VI) onto red peanut skin and its photoelectrochemical reduction into Cr3+ were investigated. The material has been characterized by infrared spectroscopy and scanning electron microscopy. It was successfully applied to the removal of chromium in aqueous air equilibrated powder suspension. The influence of the contact time, initial concentration, pH and temperature has been studied. The best performance occurred at 50ºC in the acidic solution (200 mg L-1, pH 2) with an uptake removal of 85% in less than 30 min and the adsorption follows a pseudo second order kinetic. The experiments have been carried out in a batch reactor; the data were evaluated using the linear isotherms of Langmuir and Freundlich models. The maximal adsorption capacity (44.05 mg g-1) has been determined from the Langmuir model. The thermal variation obeys to the Arrhenius type law from which the thermodynamic parameters ΔHº, ΔSº and ΔGº have been deduced. The chromate adsorption is spontaneous and endothermic in nature. Red Peanut Skin is used as a post treatment technique and the adsorption is coupled to light driven catalysis over the hetero-system CuAl2O4/TiO2. A reduction of more than 58% of HCrO4- after similar to 2 h is achieved under optimal conditions. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Adsorption, Aqueous-Solution, Chromium, Cr(VI), Electron Microscopy, Freundlich, Hexavalent Chromium, Hydrogen Evolution, Isotherm, Isotherms, Kinetic, Langmuir, Low-Cost Adsorbents, Metals, pH, Photoreduction, Reduction, Thermodynamic, Thermodynamic Parameters, TiO2, Waste, Water

? Deniz, F., Karaman, S. and Saygideger, S.D. (2011), Biosorption of a model basic dye onto *Pinus brutia* Ten.: Evaluating of equilibrium, kinetic and thermodynamic data. *Desalination*, **270** (1-3), 199-205.

Full Text: [2011\Desalination270, 199.pdf](2011/Desalination270,%20199.pdf)

Abstract: The potential of pine cones as a natural biosorbent was investigated for adsorptive removal of Basic Red 46 (BR 46) from aqueous solutions. Various physico-chemical parameters were studied such as solution pH, biosorbent dosage, biosorbent size, dye concentration, temperature, contact time and ionic strength. The equilibrium data fitted well with the Langmuir isotherm. The monolayer sorption capacity was found as 73.53 mg g-1. Kinetic data were best described by the pseudo-second order model. The thermodynamic studies indicated that the biosorption reactions were spontaneous and endothermic. Activation energy was calculated as 32.33 kJ mol-1. The BR 46 was desorbed from the pine cones with 0.1 M HCl solution. The recovery for the dye was found to be higher than 90%. Thus, this study demonstrated that the pine cones could be used as a low-cost biosorbent for the treatment of the wastewater streams bearing dye. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activation Energy, Adsorption, Aqueous-Solution, Azo-Dye, Basic Red 46, Biosorbent, Biosorption, Color Removal, Dye, Elovich Equation, Equilibrium, Isotherm, Kinetic, Langmuir, Langmuir Isotherm, Malachite-Green, Methylene-Blue, pH, Pine Cones, Pinus Brutia, Recovery, Red 46, Sorption, Thermodynamic, Waste, Wastewater, Wood Sawdust

? Wang, Y.H., Gao, H., Sun, J.S., Li, J., Su, Y.X., Ji, Y.L. and Gong, C.M. (2011), Selective reinforced competitive biosorption of Ag(I) and Cu(II) on *Magnetospirillum gryphiswaldense*. *Desalination*, **270** (1-3), 258-263.

Full Text: [2011\Desalination270, 258.pdf](2011/Desalination270,%20258.pdf)

Abstract: Probing competitive biosorption of Ag(I) and Cu(II), the main concern of this paper, was started with observing individual ion biosorptions on Magnetospirillum gryphiswaldense (MSR-1), for reference to the succeeding selective reinforced processes in binary ion systems. In the control test of unitary ion systems, unsettled cells were substantiated to have better biosorption capacity than pretreated ones and optimum biosorptive conditions screened and defined experimentally. In addition, saturated extents of adsorption were obtained under the optimum conditions. The biosorptive data hereinabove were perfectly described by Langmuir isotherm and pseudo-second-order kinetic model. In binary ion biosorption, Cu(II) was observed to promote the adsorption of Ag(I) compared with that in the above control tests, with that of Cu(II) itself reduced or inhibited correspondingly. This phenomenon indicates that MSR-1 becomes a stronger biosorbent for Ag(I) in aqueous solution under the “catalysis” of Cu(II). A new Cu(II) biosorption isotherm model was worked out, which was more suitable for the inhibited Cu(II) adsorption behavior in this case than the frequently used Langmuir or Freundlich models, which is still valid for Ag(I) in the binary case. (C) 2010 Elsevier BM. All rights reserved.

Keywords: Adsorption, Aspergillus-Niger, Biomass, Biosorbent, Biosorption, Competitive Biosorption, Cu(II), Equilibrium, Freundlich, Heavy-Metal Biosorption, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Magnetospirillum Gryphiswaldense, Magnetotactic Bacteria, Pretreatment, Removal, Selective, Sigmoidal Isotherm, Temperature

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Full Text: [2011\Desalination270, 269.pdf](2011/Desalination270,%20269.pdf)

Abstract: In the present study, the competitive adsorption characteristics of binary and ternary heavy metal ions Hg2+. Pb2+ and Co2+ on polyacrylamide/attapulgite (PAM/ATP) were investigated in batch systems. PAM/ATP was prepared by the solution polymerization of acrylamide (AM) onto gamma-methacryloxypropyl trimethoxy silane (KH-570) modified attapulgite (ATP) and characterized by the technique of X-ray photoelectron spectroscopy (XPS). Equilibrium and kinetic adsorption data showed that PAM/ATP displays a high selectivity towards one metal in a two-component or a three-component system with an affinity order of Hg2+ > Pb2+ > Co2+. The equilibrium behaviors of heavy metal species with stronger affinity toward PAM/ATP can be described by the Langmuir equation while the adsorption kinetics of the metals can be well fitted to a pseudo-second-order kinetic model. Desorption was performed using hot acetic acid, and the regenerated adsorbents could be reused with little loss of adsorption capacity. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Palygorskite, Adsorption, Aqueous-Solutions, Attapulgite, Cellulose, Competitive Adsorption, Desorption, Equilibrium, Heavy Metal Ions, Heavy-Metals, Kinetic, Kinetic Model, Kinetics, Langmuir, Low-Cost Adsorbents, Mercury Removal, Polyacrylamide, Selective Adsorption, Selectivity, Sorption, Transfer Radical Polymerization, Wastewaters, XPS

? Miretzky, P. and Muñoz, C. (2011), Enhanced metal removal from aqueous solution by Fenton activated macrophyte biomass. *Desalination*, **271** (1-3), 20-28.

Full Text: [2011\Desalination271, 20.pdf](2011/Desalination271,%2020.pdf)

Abstract: Eichhornia crassipes biomass was modified by Fenton treatment and its effectiveness for Zn2+ removal from contaminated water was investigated. The Fenton activation process was optimized by varying pH, contact time, temperature, macrophyte biomass/volume Fenton reagent ratio, and Fe/H2O2 ratio. The efficiency of the Zn2+ sorption process under different experimental conditions was also determined. Experimental data showed good fitting to Langmuir Freundlich and Dubinin-Radushkevich isotherm models. Maximum sorption capacity was 0.114 and 0.203 mmol g-1 for raw and Fenton activated biomass (dose 5.0 g L-1, pH 6.0), increasing 78% after Fenton activation. Adsorption of Zn2+ to activated biomass increased as the temperature increased. The thermodynamic parameters suggested that the process was spontaneous, governed by chemical adsorption and endothermic in nature. The kinetics of the Zn2+ adsorption was tested by five models (pseudo-first-order, pseudo-second order, Elovich, intraparticle diffusion and Bangham diffusion models). The correlation coefficients for the pseudo-second order kinetic model were the highest suggesting a chemical reaction mechanism although intraparticle diffusion could not be discarded. The practical implication of this study is the development of an effective and economic technology for Zn2+ removal from contaminated waters, which is especially useful when macrophyte material is locally available. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Agricultural Waste, Copper, Equilibrium, Fenton Activation, Fly-Ash, Freundlich, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Maximum Sorption Capacity, pH, Sorption, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Zinc Biosorption, Zn(II)

? El-Latif, M.M.A. and Elkady, M.F. (2011), Kinetics study and thermodynamic behavior for removing cesium, cobalt and nickel ions from aqueous solution using nano-zirconium vanadate ion exchanger. *Desalination*, **271** (1-3), 41-54.

Full Text: [2011\Desalination271, 41.pdf](2011/Desalination271,%2041.pdf)

Abstract: The goal of this batch-test kinetic study is to evaluate the effectiveness of the different prepared nano-zirconium vanadate ion exchangers for removing cesium, cobalt and nickel from aqueous solution. The prepared samples are characterized using X-ray diffraction, Scanning Electron Microscope and Specific surface area. Analysis of the respective rate data in accordance with three kinetic models is applied. It is revealed that the kinetics of cesium sorption onto the different prepared inorganic nano-zirconium vanadate ion exchangers can be described well by the second-order and Elovich kinetic model. However, cobalt and nickel sorption kinetics may be described by the first, second-order and Elovich kinetic models. It is established that the ion exchange mechanism plays a significant role in all studied cesium sorption systems and may participate with a small extent in the studied cobalt and nickel sorption systems. Moreover, the sorption systems are governed mainly by intraparticle diffusion. Finally, nano-zirconium vanadate produced from homogeneous precipitation is selected for investigating the kinetic effect of the agitation speed and the solution temperature on the different three ion removals. It is recognized that the activation energy and the thermodynamic parameters for the sorption systems of studied ion removal using the homogeneous precipitated nano-zirconium vanadate ion exchanger are determined. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous Solution, Basic Dye, Biosorbent, Diffusion, Equilibrium, Homogeneous Precipitation, Ion Exchange, Kinetic, Kinetic Model, Kinetics, Malachite-Green, Mechanism, Nano-Zirconium Vanadate, Nickel, Radionuclides, Separation, Sorption, Sorption Kinetics, Thermodynamic, Thermodynamic Parameters

? Chou, W.L., Wang, C.T., Huang, K.Y. and Liu, T.C. (2011), Electrochemical removal of salicylic acid from aqueous solutions using aluminum electrodes. *Desalination*, **271** (1-3), 55-61.

Full Text: [2011\Desalination271, 55.pdf](2011/Desalination271,%2055.pdf)

Abstract: The removal of salicylic acid from aqueous solutions was investigated in art electrochemical cell equipped with aluminum plates by using electrocoagulation (EC). Metal hydroxides generated during EC were used to remove salicylic acid from aqueous solution, and the effects of varying current density and solution temperature on salicylic acid adsorption characteristics were evaluated. The findings indicated that complete salicylic acid removal could be achieved within reasonable removal efficiency and with relatively low electrical energy consumption. The optimum current density and temperature were found to be 1.2 mA cm-2 and 298 K, respectively. Thermodynamic parameters, including the Gibbs free energy, enthalpy, and entropy, indicated that the salicylic acid adsorption of aqueous solutions on metal hydroxides was feasible, spontaneous and endothermic in the temperature range of 288 K to 318 K. The experimental data were fitted with several adsorption isotherm models to describe the EC process. The adsorption of salicylic acid preferably fitting the Langmuir adsorption isotherm suggests monolayer coverage of adsorbed molecules. In addition, the adsorption kinetic studies showed that the EC process was best described using the pseudo-second-order kinetic model at the various current densities and temperatures. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherm, Adsorption Isotherms, Adsorption Kinetics, Catalyst, Decolorization, Degradation, Dye, Effluents, Electric Energy Consumption, Electrocoagulation, Electrocoagulation, Isotherm, Kinetic, Kinetic Model, Langmuir, Operational Parameters, Polishing Waste-Water, Salicylic Acid, Technology, Thermodynamic

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Full Text: [2011\Desalination271, 80.pdf](2011/Desalination271,%2080.pdf)

Abstract: Biosorption potential of Date Stones (DS) and Palm-Trees Waste (PTW) for the removal of a basic dye, Methylene Blue (MB), from aqueous solution was investigated. The effects of temperature, initial dye concentration and contact time on the biosorption process were studied. Experimental data were modelled by Langmuir, Freundlich and Tempkin isotherms. Langmuir isotherm model fitted well the equilibrium data for the two sorbents (DS and PTW) comparing to the Freundlich and Tempkin isotherm models. The monolayer biosorption capacity of DS and PTW biomass for Methylene Blue was found to be 43.47 and 39.47 mg g-1 respectively. The calculated thermodynamic parameters, namely, Δ*G*, Δ*H* and Δ*S* showed that the biosorption of Methylene Blue on both agriculture waste biomasses was spontaneous and endothermic under examined conditions. Experimental data were also modelled using the biosorption kinetic models. The results showed that the biosorption processes of Methylene Blue on DS and PTW followed well pseudo-second-order kinetics in the temperature range 20-70ºC. Results indicated that DS and NW could be an alternative for more costly adsorbents used for dye removal. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Basic Dye, Biosorption, Date Stones, Dye, Equilibrium, Fibers, Freundlich, Freundlich And Tempkin Isotherms, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Mechanism, Methylene Blue, Methylene-Blue Biosorption, Palm-Trees Waste, Removal, Sorption, Steam, Tempkin, Thermodynamic, Thermodynamic Parameters, Waste, Wastewater Effluents, Water, Wheat-Straw

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Full Text: [2011\Desalination271, 111.pdf](2011/Desalination271,%20111.pdf)

Abstract: This article investigates the removal of ammonium from aqueous solutions using zeolite synthesized from fly ash by a fusion method, which combines alkaline fusion followed by hydrothermal treatment. The cation exchange capacity increases from 0.03 to 2.79 meq/g during the synthesis process. The effects of contact time, pH, initial ammonium concentration, adsorbent dosage, and the presence of other cations and anions are examined by batch experiments. The findings show that these parameters have significant effects on the ammonium removal using the synthesized zeolite. The effect of cations follows the order K+>Ca2+>Na+>Mg2+, while the effect of anions follows the order CO32->Cl->SO42-. The Lagergren first-order. Ho’ pseudo-second-order, and intraparticle diffusion kinetic models are employed to describe the kinetic data, and Ho’ pseudo-second-order model provides excellent fitting. The equilibrium isotherm data are fitted to the Langmuir, Freundlich, Koble-Corrigan, Tempkin and Dubinin-Radushkevich models; the Koble-Corrigan model gives the best fit. The thermodynamic study reveals that ammonium uptake by the synthesized zeolite is an exothermic reaction. The maximum ammonium uptake capacity obtained is 24.3 mg/g. The regenerated zeolite has almost the same ammonium uptake capacity as the original zeolite. These results indicate that the synthesized zeolite is a promising material for removing ammonium from wastewater. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Ammonium, Ammonium Removal, Anions, Aqueous Solutions, Batch, Batch Experiments, Capacity, Cation, Cation Exchange, Clinoptilolite, Concentration, Data, Diffusion, Equilibrium, Equilibrium Isotherm, Exothermic, Experiments, First Order, Fly Ash, Freundlich, Fusion, Fusion Method, Intraparticle Diffusion, Ion Exchange, Ion-Exchange Uptake, Isotherm, Kinetic, Kinetic Models, Kinetics, Lagergren, Langmuir, Model, Models, Mordenite, Natural Zeolite, pH, Phosphate, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Rights, Solutions, Synthesis, Synthesized Zeolite, Tempkin, Thermodynamic, Treatment, Uptake, Waste-Water, Wastewater, Zeolite

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Full Text: [2011\Desalination271, 199.pdf](2011/Desalination271,%20199.pdf)

Abstract: The removal of Pb(II), Cu(II) and Cd(II) ions onto polyazomethineamides (PAMA) has been investigated using batch adsorption techniques. The extent of adsorption was investigated as a function of pH, adsorbent dose, contact time and initial metal ion concentration. The metal ion removal was pH-dependent and reached maximum at pH 6.0. Experimental data were analysed by Langmuir, Freundlich, Redlich-Peterson and Temkin adsorption isotherms. The characteristic parameters for each isotherms and related correlation coefficients have been determined using MATLAB 7.1. The maximum adsorption capacities of PAMA for Pb(II), Cu( II) and Cd(II) ions were calculated from the Langmuir isotherm 452.1, 470.7 and 462.3 mg/g respectively. Pseudo-first-order, pseudo-second-order, Elovich kinetic and intraparticle diffusion models were used to fit the experimental data. Kinetic parameters, rate constants, equilibrium sorption capacities and related correlation coefficients, for each kinetic model were calculated and discussed. The kinetic studies showed that the pseudo-second-order rate equation was better described by the adsorption process. The FT-IR spectra of the adsorbent indicated that the amide, amide carbonyl and azomethine groups were major binding sites with the metal ions. The adsorption of PAMA for heavy metal is selective, and the adsorption capacity is in the order of Cu(II)>Cd(II)> Pb(II). (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Cadmium, Cd(II), Chitosan, Copper(II), Cu(II), Equilibrium, Freundlich, FT-IR, FTIR, Heavy Metal Ion, Heavy-Metals, Isotherm, Isotherms, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Models, Pb(II), Peat, pH, Polyazomethineamides (PAMA), Removal, Selective, SEM Analysis, Silica, Sorption, Waste

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Full Text: [2011\Desalination271, 225.pdf](2011/Desalination271,%20225.pdf)

Abstract: Adsorption of an azo reactive dye. C.I. Reactive Red 120 (RR120), from aqueous solution on chitosan and on a chitosan nanodispersion has been studied. The nanodispersion was prepared using a mixture of chitosan and sodium tripolyphosphate. The results showed that the adsorption of RR120 on dissolved chitosan and on the chitosan nanodispersion was affected significantly by initial dye concentration, sorbent amount, temperature, pH and ionic strength of the solution. Maximum dye removal for both adsorbents was at a pH of 4-5 and the adsorption of the reactive dye on both dissolved chitosan and the nanodispersion gave good fit to the Langmuir isotherm model. The adsorption capacity of the nanodispersion was around 910 mg g-1, much higher than of dissolved chitosan, which was 51 mg The adsorption of the dye on the chitosan nanodispersion reached equilibrium much faster than on dissolved chitosan. The kinetics of the adsorption correlated well with the pseudo-second order model. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acid-Solutions, Activated Carbon, Adsorption, Adsorption Properties, Aqueous-Solutions, Beads, Behavior, Chitin, Chitosan, Dye, Equilibrium, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Nanodispersion, Nanoparticles, pH, Reactive Dye, Temperature, Wastewater

? Omraei, M., Esfandian, H., Katal, R. and Ghorbani, M. (2011), Study of the removal of Zn(II) from aqueous solution using polypyrrole nanocomposite. *Desalination*, **271** (1-3), 248-256.

Full Text: [2011\Desalination271, 248.pdf](2011/Desalination271,%20248.pdf)

Abstract: Zinc is one of the most important pollutants for surface and ground water. Because of its acute Toxicity and non-biodegradability, zinc-containing liquid and solid wastes are considered as hazardous wastes. The aim of this research work is to investigate sorption characteristic of polypyrrole coated on the sawdust (PPy/SD) for the removal of Zn (II) ions from aqueous solutions. The sorption of Zn (II) ions by batch method is carried out. The optimum conditions of sorption were found to be: a PPy/SD dose of 0.5 g in 100 mL of Zn(II), contact time of 14 min, pH and temperature 3 and 40ºC respectively. It was found that temperature has a positive effect on the removal efficiency. Three equations, i.e. Morris-Weber, Lagergren and pseudo-second order have been tested to track the kinetics of removal process. The kinetic data indicated that the adsorption process was controlled by pseudo-second-order equation. The Langmuir, Freundlich and D-R are subjected to sorption data to estimate sorption capacity, intensity and energy. The data is fitted with Freundlich. The thermodynamic parameters Δ*H*, Δ*S* and Δ*G* are evaluated. Thermodynamic parameters showed that the adsorption of Zn(II) onto PPy/SD was feasible, spontaneous and endothermic under studied conditions. It can be concluded that PPy/SD has potential to remove Zn(II) ions from aqueous solutions at different concentrations. It was found that increasing the initial concentration causes decreasing in the ion removal. For the desorption experiments, several solvents (alkaline, bases and water) have been used. It was achieved 75% desorption efficiency using NaOH also PPy/SD has been used for the removal of Zn (II) from real waste water (plating wastewater and shows high efficiency in the zinc removal. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Desorption, Equilibrium, Fixed-Bed Column, Freundlich, Haro River Sand, Hexavalent Chromium Removal, Isotherm, Jute Fiber, Kinetic, Kinetics, Langmuir, Metal-Ions, pH, Polypyyrole, Removal, Sawdust, Sorption, Thermodynamic, Thermodynamic Parameters, Waste, Waste-Water, Wastewater, Wood Sawdust, Zinc, Zn(II)

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Full Text: [2011\Desalination271, 265.pdf](2011/Desalination271,%20265.pdf)

Abstract: The discharge of excessive concentration of orthophosphate (PO4-P) ions into the receiving water causes environmental problems such as “eutrophication.” The aim of the present study was to investigate the adsorption behavior of limestone (LS), granular activated carbon (GAC) and the mixture of both adsorbents for orthophosphate removal from domestic wastewater. The range of initial concentration of PO4-P throughout the study was between 9 and 25 mg/L. Effects of contact/settling times, pH, adsorbent dosage, initial concentration, adsorption isotherm models and kinetics were studied in batch-scale experiments while for the column experiments, the effects of flow rate, pH and initial concentration were studied. Limestone alone was shown to be an effective adsorbent which has potential to remove over 90% orthophosphate at optimum conditions. The lower initial concentration (2.5 mg PO4-P/L) yielded the maximum removal (94%) compared to the higher concentration (80% removal at 100 mg PO4-P/L). Freundlich and Langmuir isotherms provided good correlation coefficient for PO4-P and the data agreed with the pseudo-second-order kinetics model (R-2>0.95). In the up-flow column study, higher flow rate, alkaline pH and higher initial concentration yielded shorter column saturation time. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherm, Adsorptive Removal, Ammonia, Domestic Wastewater, Fly-Ash, Freundlich, Freundlich and Langmuir Isotherms, Granular Activated Carbon, Infiltration System, Iron, Isotherm, Isotherms, Kinetics, Langmuir, Leachate, Limestone, Nutrient Removal, Orthophosphate, pH, Phosphate Removal, Phosphorus Removal, Wastewater

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Full Text: [2011\Desalination271, 301.pdf](2011/Desalination271,%20301.pdf)

Abstract: *Melocanna baccifera* (Bamboo) is the most abundant and economically important non-timber product in the State of Mizoram, India. The community of the region is getting benefited by this bamboo enormously. The notable uses are: tender shoots are edible and delicious preparations are prepared out of bamboo shoots, a potential source of production construction and composite materials for domestic dwellings and an important source of raw material for charcoal production, which is required for a variety of industries. This paper highlights the utility of bamboo charcoal in wastewater treatment. It is known that activated and raw charcoals from different biomass sources have wide range of application: in water treatment. Therefore, activated charcoal was prepared from *M. baccifera* raw charcoal by chemical treatment and used in various experiments to test its functions for removal of heavy metals. To achieve this, batch mode experiments were conducted choosing specific parameters such as pH (2.0-7.0), adsorbent dose (0.1-0.5 g), contact time (15-360 min) and metal ion concentrations (0.03-0.07 g/L). The surface characterization has been carried out using Autosorb-1 instrument (Quanta chrome), SEM and FTIR. From these studies, it is evident that charcoal could be used as adsorbents for removal of Ni(II) and Zn(II) from aqueous solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous Solution, Bamboo Charcoal, Batch Adsorption, Biosorption, Carbon, Cd(II), Charcoal, Composite, Equilibrium Parameters, FTIR, Heavy Metals, Ions, KOH, Melocanna Baccifera, Ni(II), Nickel(II), Nickel(II), pH, Recovery, Sorption, Wastewater, Wastewater Treatment, Zinc(II)

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Full Text: [2011\Desalination272, 98.pdf](2011/Desalination272,%2098.pdf)

Abstract: The present article demonstrates the synthesis of p-tetraaminocalix[4]arene- and p-tetrathioureacalix[4] arene-based resins (4 and 5). The resins (4 and 5) were characterized by using different analytical techniques such as FT-IR and elemental analysis. In addition, their comparative fluoride sorption study was conducted and it was observed that 5 is highly efficient for the removal of fluoride from aqueous media at a wide range of pH as compared to 4. Consequently, on the basis of kinetic and thermodynamic studies, the pseudo first-order, pseudo second-order, entropy, enthalpy, and Gibbs free energy of fluoride sorption onto resin 5 were calculated. The experimental data were also evaluated by equations of isotherms used, i.e., Freundlich, Langmuir. and Dubinin-Radushkevich. The observations reveal that the sorption is favorable and confer the physiosorption interaction between resin 5 and fluoride. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Amberlite Resin, Aqueous-Solution, Behavior, Calixarene, Derivatives, Fluoride, Fly-Ash, Freundlich, FT-IR, FTIR, Ions, Isotherms, Kinetic, Langmuir, Merrifield Resin, pH, Preconcentration, Removal, Resin, Resins, Solid-Phase Extraction, Sorption, Sorption Isotherm, Thar Desert, Thermodynamic, Water

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Full Text: [2011\Desalination272, 187.pdf](2011/Desalination272,%20187.pdf)

Abstract: This paper investigates the ability of activated carbon (AC) to adsorb two anionic dyes from colored wastewater in single and binary systems. Direct Blue 78 (DB78) and Direct Red 31 (DR31) were used as anionic dye models. The surface characteristics of AC were investigated using fourier transform infrared (FUR) and scanning electron microscopy (SEM). The effects of AC dosage, initial dye concentration and salt on dye removal were investigated at 25ºC. The kinetic and isotherm of dye adsorption were studied. Adsorption kinetic of dyes was studied in single and binary systems and rate sorption was found to conform to pseudo second order kinetic model. The isotherm data of dyes in single and binary systems followed Langmuir isotherm. The maximum adsorption capacity (Q(0)) of DB78 and DR31 was 76.92 mg/g and 111 mg/g for single system and 76.92 mg/g and 125 mg/g for binary system, respectively. Results indicated that AC could be used as an adsorbent to remove the anionic dyes from single and binary pollutants systems. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activated Carbon, Activated Carbon (Ac), Adsorption, Adsorption Behavior, Adsorption Kinetic, Agricultural Waste, Aqueous-Solutions, Binary System, Chitosan, Colored Wastewater, Dye, Dye Adsorption, Dye Removal, Dyes, Effluent, Electron Microscopy, Equilibrium, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Metal-Ions, Reactive Dye, Sorption, Textile Dye, Wastewater

? El-Sayed, G.O. (2011), Removal of methylene blue and crystal violet from aqueous solutions by palm kernel fiber. *Desalination*, **272** (1-3), 225-232.

Full Text: [2011\Desalination272, 225.pdf](2011/Desalination272,%20225.pdf)

Abstract: The ability of palm kernel fiber (PKF) to adsorb methylene blue (MB) and crystal violet (CV) from aqueous solutions has been studied. Adsorption studies were carried out at different initial dye concentrations (20, 40. 80 and 160 mg/L), contact time, pH (1.0-11.0) and sorbent doses (0.4, 2.0, 4.0 and 8.0 g/L). Other factors affecting the absorption process as stirring rate, ionic strength and temperature of the initial dye solution were also examined. Adsorption data were modeled using Langmuir. Freundlich and Temkin adsorption isotherms. Equilibrium data of the biosorption process fitted very well to the Freundlich model (R-2 = 0.997 and 0.991 for MB and CV, respectively). The thermodynamic parameters such as ΔH º, ΔSº and ΔGº were evaluated. The dye adsorption process was found to be endothermic for the two dyes. The maximum adsorption capacity Q(o) was 95.4 mg/g for MB and 78.9 mg/g for CV at an optimum pH. Adsorption kinetic was verified by pseudo-first-order and pseudo-second-order models. The results indicated that the dye uptake process followed the pseudo second-order and saturation type rate expressions for each dye. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Adsorbent, Adsorption, Adsorption, Adsorption Isotherms, Adsorption Kinetic, Basic Dye, Biosorption, Color Removal, Crystal Violet, Decolorization, Dye, Dye Adsorption, Dyes, Equilibrium, Freundlich, Isotherms, Kinetic, Kinetics, Langmuir, Methylene Blue, Palm Kernel Fiber, pH, Plant, Removal, Sorption, Thermodynamic, Thermodynamic Parameters, Waste-Water

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Full Text: [2011\Desalination272, 233.pdf](2011/Desalination272,%20233.pdf)

Abstract: A novel adsorbent, magnesia-loaded fly ash cenospheres (MLC), was prepared by wet impregnation of fly ash cenospheres with magnesium chloride solution. Its physicochemical properties were characterized by X-ray diffractometry, Fourier transform infrared spectrometry, scanning electron microscopy and X-ray fluorescence spectrometry. Adsorption experiments were conducted to test the effects of pH, adsorbent dosage, contact time, reaction temperature and coexisting anions on fluoride removal. The coexisting ions had a large impact on fluoride removal by MLC in order comprehensive > dihydric phosphate > nitrate > sulfate. The adsorption process fitted the Langmuir isotherm and the adsorption kinetics followed the pseudo-second-order rate equation. The values of ΔGº (318 K), ΔHº and ΔSº were -0.409 kJ mol-1, 20.04 kJ mol-1 and 63.80 J mol-1K-1, respectively. The maximum adsorption capacity of MLC was about 6.0 mg g-1 in the solution with 100 mg L-1 of fluoride ions at pH 3.0 and 318 K. MLC is low cost and more effective for fluoride adsorption so as to be used widely in wastewater treatment. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Alumina, Adsorption, Adsorption Kinetics, Aqueous Solution, Chloride, Defluoridation, Drinking-Water, Electrocoagulation, Electrodialysis, Electron Microscopy, Fluoride, Fly Ash Cenospheres, Groundwater, Ions, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Magnesia-Loaded Fly Ash Cenospheres, Membrane, pH, Removal, Waste-Water, Wastewater, Wastewater Treatment

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Full Text: [2011\Desalination272, 270.pdf](2011/Desalination272,%20270.pdf)

Abstract: The biosorption characteristic of mercury ions from aqueous solution using gum karaya (*Sterculia urens*), a natural hydrocolloid was explored as a function of pH, biopolymer concentration, contact time and temperature. Langmuir model fitted the equilibrium biosorption data better than Freundlich. Tempkin and Dubinin-Radushkevich isotherm models. The maximum biosorption capacity for gum karaya was observed to be 62.5 mg g-1 as calculated by Langmuir model. Adsorption kinetic data were best fitted by pseudo-second-order kinetic model. The negative value of the Gibbs free energy change (ΔGº) indicated that the thermodynamically feasible, spontaneous nature of Hg2+ ions biosorption onto gum karaya hydrocolloid. The negative value of enthalpy change (ΔHº) and entropy change (ΔSº) revealed that biosorption of Hg2+ ions on gum karaya hydrocolloid to be an exothermic reaction and shows a decrease in the randomness at the solid/solution interface during the biosorption process of Hg2+ ions by the biopolymer. The biosorbed mercury ions on gum karaya hydrocolloid were desorbed (95%), by 0.1 M HCl. The metal interaction with biopolymer was assessed by FT-IR and SEM analysis. An irregular and porous structure was observed by SEM analysis before Hg2+ biosorption and upon Hg2+ biosorption showed metal capped structures. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Adsorption Kinetic, Aqueous Solution, Biomass, Biosorption, Chitin, Equilibrium, Freundlich, FT-IR, FTIR, Gum Karaya, Heavy-Metals, Hg2+, Hydrocolloid, Ions, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Mercury, pH, Removal, SEM Analysis, Tempkin, Thermodynamics

? Liu, B.J., Wang, D.F., Li, H.Y., Xu, Y. and Zhang, L. (2011), As(III) removal from aqueous solution using α-Fe2O3 impregnated chitosan beads with As(III) as imprinted ions. *Desalination*, **272** (1-3), 286-292.

Full Text: [2011\Desalination272, 286.pdf](2011/Desalination272,%20286.pdf)

Abstract: A novel, bio-based alpha- Fe2O3 impregnated chitosan beads (As-IFICB) was successfully synthesized using As(III) as imprinted ions for adsorption and removal of As(III) ions from aqueous solutions. Batch adsorption experiments were performed to evaluate the adsorption conditions, selectivity and reusability. The results showed that the maximum adsorption capacity was 6.18 mg/g, observed at pH 5 and temperature 30ºC. Equilibrium adsorption was achieved within 6 h. The kinetic data, obtained at the optimum pH 5, could be fitted with a pseudo-second order equation. Adsorption process could be well described by Langmuir adsorption isotherms and the maximum adsorption capacity calculated from Langmuir equation was 9.355 mg/g. The selectivity coefficient of As(III) ions and other metal cations onto As-IFICB indicated an overall preference for As(III) ions, which was much higher than non-imprinted chitosan beads. The adsorption of As-IFICB for As(III) was analyzed and explained using SEM, EDAX, XRD and BET-N-2 adsorption measurement. The results above indicated that As-IFICB is a very promising sorbent for selective removal of As(III) ions from aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherms, Adsorption Properties, Alpha-Fe2O3, Aqueous Solution, Arsenic Removal, As(III), Batch, Batch Adsorption, Carboxymethyl-Chitosan, Chitosan Beads, Equilibrium, Ferric Ions, Heavy-Metals, Ion-Imprinted, Iron-Oxide, Isotherms, Kinetic, Langmuir, pH, Polymer, Selective, Solid-Phase Extraction, Water

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Full Text: [2011\Desalination272, 293.pdf](2011/Desalination272,%20293.pdf)

Abstract: A batch adsorption system was applied to study the adsorption of humic acid onto chitosan- H2SO4 beads. Different parameters affecting the adsorption capacity such as initial pH, agitation period, different temperatures and different initial concentrations of humic acid were studied. The adsorption of humic acid onto chitosan- H2SO4 beads agreed well with the non-linear Langmuir, Freundlich and Sips isotherm models. Based on the Langmuir isotherm model, the maximum adsorption capacities attained by chitosan-H2SO4 beads at 300, 310 and 320 K were 377.40, 363.50 and 342.50 mg/g, respectively. Different temperatures affected the adsorption process and it was found that the adsorption process was endothermic in nature. The pseudo-second-order kinetic model, which assumed that chemisorption, was the rate-limiting step best described the adsorption of humic acid onto chitosan-H2SO4 beads. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Chitosan-H2so4 Beads, Copper(II), Dye Removal, Equilibrium, Freundlich, Humic Acid, Hydrogel Beads, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Lead, Metal, Nonlinear, pH, Sorption, Substances, Temperature, Water

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Full Text: [2011\Desalination272, 301.pdf](2011/Desalination272,%20301.pdf)

Abstract: The ability of Polyaniline coated on saw dust as synthetic adsorbent was investigated for adsorptive removal of Cd (II) ions from aqueous solutions by batch operation. It was found that polyaniline coated on saw dust (PANI/SD) is very easy and simple to prepare and can be used as an effective adsorbent for removal of Cd (II) ions from aqueous solutions. Various physico-chemical parameters such as pH, initial metal ion concentration, and adsorbent dosage level and equilibrium contact time were studied. The adsorption of Cd (II) ions increased with an increase in pH. The optimum solution pH for adsorption of Cd (II) from aqueous solutions was found to be 6. Adsorption was rapid and occurred within 20 min for a cadmium concentration range of 10:40 mg L-1. The kinetic process of Cd (II) adsorption onto PANI/SD was found to fit the pseudo-second-order rate equation. The equilibrium adsorption data for Cd (II) were better fitted to the Freundlich adsorption isotherm model. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorption, Adsorption Isotherm, Aqueous-Solutions, Biosorption, Cadmium, Cadmium Ions, Cd(II), Equilibrium, Fly-Ash, Freundlich, Heavy Metal, Heavy-Metals, Isotherm, Kinetic, pH, Polyaniline, Polymers, Removal, Sawdust, Separation, Sorption, Sorption, Waste, Wastewater Treatment

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Full Text: [2011\Desalination272, 313.pdf](2011/Desalination272,%20313.pdf)

Abstract: The present study deals with the utilization of an inexpensive agro-industrial waste rice husk for the removal of Direct Red-31 and Direct Orange-26 from aqueous solutions in a batch mode. Experiments were carried out as function of pH, biosorbent dose, particle size of biosorbent, initial dyes concentration, contact time and temperature. The equilibrium biosorption data were analyzed by Langmuir, Freundlich, Temkin, Doubinin-Radushevich (D-R) and Harkins-Jura isotherm models. The results indicated that the Langmuir model provided the best correlation of the experimental data for both dyes. The biosorption kinetic data were modeled using the pseudo-first-order, pseudo-second-order and intra-particle diffusion kinetic equations. It was observed that the pseudo-second-order kinetic equation could explain the biosorption kinetics of dyes on rice husk. Thermodynamic parameters such as enthalpy change (ΔHº), entropy change (ΔSº) and free energy change (ΔGº) were also investigated. Free energy change showed that biosorption of Direct Red-31 and Direct Orange-26 was spontaneous at all studied temperatures (30-70ºC). Surface adsorption of both the dyes at specific binding sites was confirmed through and Fourier Transform infrared spectroscopic (FT-IR) analysis. The changes in surface morphology of rice husk before and after adsorption was investigated through scanning electron microscopy (SEM). It was implied that rice husk may be suitable as an adsorbent for removal of direct dyes from aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Biomass, Biosorbent, Biosorption, Biosorption, Direct Dyes, Dyes, Electron Microscopy, Equilibrium, Equilibrium, Freundlich, FT-IR, FTIR, Isotherm, Kinetic, Kinetics, Langmuir, Low-Cost Adsorbents, Methylene-Blue, Modeling, pH, Reactive Dye, Rice (Oryza Sativa) Husk, Sorption, Textile Dyes, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste, Waste Material

? Jagtap, S., Yenkie, M.K., Das, S. and Rayalu, S. (2011), Synthesis and characterization of lanthanum impregnated chitosan flakes for fluoride removal in water. *Desalination*, **273** (2-3), 267-275.

Full Text: [2011\Desalination273, 267.pdf](2011/Desalination273,%20267.pdf)

Abstract: In the present research work, biopolymer chitosan has been modified by impregnation of lanthanum to enhance the fluoride removal capacity of chitosan. The effect of various synthesis parameters like lanthanum loading, stirring time and drying temperature, on fluoride removal has been studied. It was observed that the synthesis parameters have significant influence on development of LCF and in turn on fluoride removal capacity. The adsorbent has been characterized with XRD. SEM and FUR studies. The optimal condition for synthesis of LCF includes lanthanum loading: 20 wt.%, stirring time: 6 h, drying temperature: 75ºC for 2 h with maximum adsorption capacity of 1.27 mg/g. XRD Pattern of LCF was compared with bare chitosan which shows that chitosan structure is retained after lanthanum impregnation. SEM of LCF shows the presence of spherical particles spread over the chitosan matrix. The experimental data fitted well in Freundlich isotherm and follows pseudo-second order kinetics and governed by intra-particle diffusion and it is a complex process. Effect of pH and effect of presence of interfering ions on adsorption of fluoride were studied. The performance of LCF was compared with many other reported adsorbent for fluoride removal. Reuse and regeneration capacity of LCF was also explored. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Alumina, Aqueous-Solution, Biopolymer, Characterization, Chitosan, Defluoridation, Diffusion, Equilibrium, Fluoride Adsorption, Fluoride Removal, Freundlich, Freundlich Isotherm, Isotherm, Kinetics, Lanthanum Impregnated Chitosan, pH, Removal, Synthesis, Temperature, Water

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Full Text: [2011\Desalination273, 321.pdf](2011/Desalination273,%20321.pdf)

Abstract: The present study explored the adsorptive characteristics of Brilliant Green dye from aqueous solution onto NaOH treated saw dust of Indian Eucalyptus wood, a timber industry waste. Batch studies were performed to evaluate the influence of various experimental parameters like initial pH, contact time, adsorbent dose, initial concentration and temperature on the removal of Brilliant Green. Optimum conditions were found to be initial pH = 2.9, contact time = 3 h and adsorbent dose = 4 g/l. The pseudo-second-order kinetic model represented the adsorption kinetics of Brilliant Green onto NaOH treated saw dust. Equilibrium isotherms were analyzed by Freundlich, Langmuir, Redlich-Peterson and Temkin isotherm models using non-linear regression technique. NaOH treated saw dust which was used showed surface area = 0.3742 m2/g, pore volume = 0.00836 cm3/g and average pore diameter = 893.6 A degrees. Adsorption of Brilliant Green onto NaOH treated saw dust is favorably influenced by decrease in the temperature of the operation. Thermodynamics showed that the Brilliant Green adsorption was most favorable onto NaOH treated saw dust. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Kinetics, Adsorption Thermodynamics, Aqueous Solution, Bagasse Fly-Ash, Batch, Bottom Ash, Brilliant Green, Congo Red, Dye, Equilibrium, Equilibrium Isotherm, Freundlich, Industry Waste-Water, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Methylene-Blue Adsorption, Nonlinear, pH, Removal, Rice Husk Ash, Saw Dust, Temperature, Textile-Industry, Thermodynamics, Waste, Zinc(II) Metal-Ions

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Full Text: [2011\Desalination273, 330.pdf](2011/Desalination273,%20330.pdf)

Abstract: Adsorption reactions of Cd(II) and Cu(II) with nanoparticle agglomerates of titanium(IV) oxide (NHTO) were investigated from single and bi-component systems at optimized pH 5.0. Kinetic data of metal ion removal reactions described the pseudo-second order equation very well. Both Langmuir and Redlich-Peterson models described the equilibrium data well (R-2>0.95). Values of the monolayer adsorption capacities (mg.g(-1)) of Cd(II) (49.50 to 60.24) and Cu(II) (42.02 to 52.63) were high, and that increased with increasing temperature on the reactions. Thermodynamic analyses of the equilibrium data suggested that the removal reactions were spontaneous [-Delta G(0), kj.mol(-1) = 24.31 to 32.73 for Cd(II); and 19.62 to 27.38 for Cu(II)]. Spontaneity of the reactions increased with increasing temperature. Langmuir monolayer adsorption capacity of either Cd(II) or Cu (II) was less in presence of each other than that of single component systems. The mean adsorption energy estimation suggested that the interaction between either of the metal ions with NHTO was columbic type. About 71 to 75% of adsorbed metal ions could be recovered as the metal oxide from their solutions, which were obtained by the desorption reaction with 0.1 M HCl. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solutions, Bi-Component, Biosorption, Cadmium, Cadmium(II), Cd(II), Copper, Copper(II), Cr(III), Cu(II), Desorption, Equilibrium, Ions, Iron-Oxide, Isotherm, Isotherm, Kinetic, Kinetics, Langmuir, Modeling, Nanostructured Titanium Oxide, pH, Removal, Temperature, Thermodynamic, Waste

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Full Text: [2011\Desalination274, 13.pdf](2011/Desalination274,%2013.pdf)

Abstract: The objective of this work was to determine the optimum conditions for adsorption/desorption of reactive dyes, using both batch experiments and fixed bed columns with humin immobilized on silica. Results of batch experiments showed that adsorption of Reactive Orange 16 and Reactive Red 120 by humin was most effective at pH 1.0. Adsorption equilibrium was achieved rapidly for all initial dye concentrations employed. Temperature measurements indicated that the process was exothermic, and described by a pseudo-second order kinetic model for both dyes, while the Freundlich and Langmuir isotherms best described the adsorptions of RO 16 and RR 120, respectively. Column experiments showed adsorption efficiencies of 62.1 to 39.6% and 96.2 to 74.8%, and desorption efficiencies of 81.4 to 51.3% and 66.8 to 36.8% for RO 16 and RR 120, respectively, over three cycles. The biosorbent presents excellent performance in removal of reactive dyes, with the advantage that it can be regenerated and reused. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Characteristics, Aqueous-Solution, Basic Dye, Biosorbent, Desorption, Dye, Dyes, Equilibrium, Freundlich, Freundlich And Langmuir Isotherms, Green Chemistry, Heavy-Metals, Humin, Isotherms, Kinetic, Kinetic Model, Langmuir, Methylene-Blue, Orange 16, pH, Removal, *Rhizopus-arrhizus*, Rice-Husk, Silica, Silica-Immobilized Humin, Temperature, Waste-Water

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Full Text: [2011\Desalination274, 64.pdf](2011/Desalination274,%2064.pdf)

Abstract: In this study, the feasibility of using H3PO4-activated lignin for hexavalent chromium adsorption has been investigated. The composite of activated lignin was characterized using FTIR, XRD and SEM with EDAX analysis. It was observed that the pH had a strong effect on the adsorption capacity; adsorption of Cr(VI) was more favorable at acidic pH with maximum uptake at pH 2. The adsorption equilibrium data were best represented by Koble-Corrigan isotherm. The monolayer sorption capacity obtained from the Langmuir model was found to be 77.85 mg/g. Adsorption showed pseudo-second order rate kinetics and the process involving the rate-controlling step is complex as it involves both film and intraparticle diffusion processes. The NaOH desorbing agent was able to release approximately 84% of metal ions. Thermodynamic parameters showed that the sorption process is exothermic and non-spontaneous. The overall Cr(VI) retention on the activated lignin surface perhaps includes both the physical adsorption of Cr(VI) and the consequent reduction of Cr(VI) to Cr(III). (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 2,4,6-Trichlorophenol, Activated Carbon, Activated Lignin, Adsorption, Adsorption-Isotherm, Biosorption, Chromium, Chromium (VI), Composite, Cr(III), Cr(VI), Desorption, Diffusion, Equilibrium, FTIR, H3PO4 Activation, Isotherm, Kinetics, Langmuir, Lead, pH, Reduction, Removal, Sorption, Thermodynamic, Thermodynamic Parameters, Uptake, Waste

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Full Text: [2011\Desalination274, 81.pdf](2011/Desalination274,%2081.pdf)

Abstract: The adsorption of direct yellow 161 dye from aqueous solution on derived bamboo charcoals activated with orthophosphoric acid, nitric acid, potassium hydroxide and zinc chloride was investigated. Batch adsorption results showed that under optimal sorption condition including initial dye concentration 24.62 mg/L, pH 1.0, contact time 21 h, and temperature 298 k the maximum and the minimum adsorption capacities were 2.401 mg/g and 1.705 mg/g for bamboo charcoals activated with orthophosphoric acid and with potassium hydroxide, respectively. Avrami kinetic model provided the best fit to experimental data compared with Elovich, pseudo-first-order, pseudo-second-order and intra-particle diffusion models. Fitting of the equilibrium data using Langmuir, Freundlich, Jovanovic, Khan and Koble-Corrigan isotherm models indicated that Koble-Corrigan model was the best and three-parameter models gave better fitting than two-parameter models did. Thermodynamic parameters revealed that the adsorption process was spontaneous and endothermic with a physical nature. Compared with the other activated bamboo charcoals the bamboo charcoal activated with orthophosphoric acid was the best adsorbent for removal of direct yellow 161 dye. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous Solution, Bamboo Charcoal, Batch, Batch Adsorption, Brilliant Green-Dye, Carbon, Chloride, Diffusion, Direct Yellow 161, Dye, Equilibrium, Freundlich, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Low-Cost Adsorbents, Methylene-Blue, Nonlinear Isotherms, Parameters, pH, Reactive Dyes, Removal, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water, Zinc

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Full Text: [2011\Desalination274, 97.pdf](2011/Desalination274,%2097.pdf)

Abstract: A novel approach to prepare adsorbent from pine tree root decayed by brown-rot fungi (BRW) has been tried for the first time to remove malachite green (MG) from aqueous solutions. The adsorption capacity of MG was increased 19.45% compared with the pine sawdust. The adsorption capacity was studied by varying the parameters such as initial dye concentration, adsorbent dose, temperature and pH value. Optimal adsorption capacity (42.63 mg/g) and rate (99.41%) was obtained at near neutral pH. Characterization of the biosorbent was performed using scanning electron microscope (SEM), energy dispersive X-ray spectroscope (EDS) and Fourier transform-infrared (FTIR) spectroscopy. The kinetic and equilibrium studies suggest that the adsorption follows Langmuir isotherm and the pseudo-second-order model. Together with the evaluation of the thermodynamic parameters such as Gibbs free energy, enthalpy and entropy, our results showed that MG adsorption onto BRW was mainly a spontaneous, endothermic and chemisorption process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Attack, Biomass, Biosorbent, Brown-Rotted Wood, Carbon, Characterization, Dye, Equilibrium, FTIR, Isotherm, Kinetic, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Malachite Green, Mechanism, Mg, pH, Removal, Sawdust, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water

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Full Text: [2011\Desalination275, 141.pdf](2011/Desalination275,%20141.pdf)

Abstract: The present study dealt with sorption of cadmium (Cd2+) and nickel (Ni2+) ions on Spirulina platensis as a function of contact time, initial metal concentration, and pH regimes. Characterization of this adsorbent was confirmed by FTIR spectrum. Rapid sorption of both metal’s ions was observed during the first 60 min of contact time and favored at pH; 5. The sorption of these metal’s ions could be described by Langmuir isotherm that maximum sorptions (73.64 mg g(-1) for Cd2+ and 69.04 mg g(-1) for Ni2+) are related to saturated monolayer of adsorbate molecules on the surface. Sorption kinetics of Cd2+ and Ni2+ ions on S. platensis was better described by pseudo second-order model. This sorption could be explained by the intra-particle diffusion, which was composed of more than one sorption processes. The cyanobacterium showed remarkable performance for removing of Cd2+ and Ni2+ ions as an eco-friendly process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous-Solution, Biomass, Biosorption, Cadmium, Cd(II), Characterization, Diffusion, Equilibrium, Ions, Isotherm, Kinetic, Kinetics, Langmuir Isotherm, Model, Modeling, Ni(II), Nickel, Nickel Ions, Parameters, pH, Pseudo-Second-Order, Removal, Rice Husk Ash, Sorption, Spirulina Platensis

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Full Text: [2011\Desalination275, 10.pdf](2011/Desalination275,%2010.pdf)

Abstract: The objective of this study was to investigate the ability of synthetic calcium phosphates to remove a textile dye from aqueous solutions. The adsorption of Reactive Yellow 4 (RY4) on apatitic tricalcium phosphate (PTCa) and apatitic octocalcium phosphate (OCPa) from aqueous solutions was investigated. The kinetic study shows that equilibrium is quickly obtained for both phosphates. The kinetic analysis showed that the pseudo-second-order model had the best fit to the experimental data. The adsorption isotherms of the dye by both phosphates were correlated with Langmuir and Freundlich models depending on the phosphate studied. In addition, the maximum adsorption capacity decreased from 35.50 to 31.86 mg/g and 29 to 19.85 mg/g for PTCa and OCPa. respectively, when the temperature was increased from 25 to 45 degrees C. The thermodynamic evaluation of RY4 adsorption on both phosphates revealed that the adsorption phenomenon was a spontaneous, exothermic and physical process. Accordingly; synthetic calcium phosphates have been shown to be a very efficient and low-cost adsorbent, and a promising alternative for eliminating dyes from industrial wastewaters. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorbents, Adsorption, Aqueous-Solutions, Bentonite, Dye, Equilibrium, Evaluation, Hydroxyapatite, Isotherms, Kinetics, Kinetics, Langmuir and Freundlich Models, Mechanism, Methylene-Blue, Model, Phosphates, Pseudo-Second-Order, Quartz-Crystal Microbalance, Waste-Water

? Errais, E., Duplay, J., Darragi, F., M’Rabet, I., Aubert, A., Huber, F. and Morvan, G. (2011), Efficient anionic dye adsorption on natural untreated clay: Kinetic study and thermodynamic parameters. *Desalination*, **275** (1-3), 74-81.

Full Text: [2011\Desalination275, 74.pdf](2011/Desalination275,%2074.pdf)

Abstract: This research involved the efficient adsorption of an anionic dye (Reactive Red 120) by natural untreated clay, a low-cost material abundant in highly weathered soils. The adsorption kinetics was investigated using the parameters such as contact time, stirring speed, initial dye concentration, initial pH, ionic strength, and solution temperature. According to these experiments the maximum removal is observed after 80 to 100 min. The results showed that acid pH is favorable for the adsorption of dye and physisorption on broken edges of clay particles seemed to play a major role in the adsorption process. It was found that the rate of adsorption decreases with increasing temperature and the process is exothermic. The adsorption kinetics followed the pseudo-second-order equation for the dye investigated in this work. Furthermore the thermodynamic activation parameters such as the enthalpy and entropy were determined. Compared to adsorption experiments on other clays, the results show that the Fouchana natural clay is an efficient adsorbent for Reactive Red 120 dye. (C) 2011 Elsevier BM. All rights reserved.

Keywords: Activated Carbons, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Adsorption Thermodynamics, Anionic Dye, Aqueous-Solution, Basic-Dyes, Color Removal, Equilibrium, Fly-Ash, Kinetic, Kinetics, Malachite-Green, Methylene-Blue, Natural Clay, pH, Pseudo-Second-Order, Reactive Dyes, Reactive Red 120, Research, Rhodamine-B, Thermodynamic Parameters

? Xu, J.H., Gao, N.Y., Deng, Y., Sui, M.H. and Tang, Y.L. (2011), Perchlorate removal by granular activated carbon coated with cetyltrimethyl ammonium chloride. *Desalination*, **275** (1-3), 87-92.

Full Text: [2011\Desalination275, 87.pdf](2011/Desalination275,%2087.pdf)

Abstract: In this study, granular activated carbon (GAC) coated with cetyltrimethyl ammonium chloride (GAC-CTAC) was synthesized to remove perchlorate from water. Bench scale kinetics and adsorption isotherm tests were performed to evaluate the effects of factors affecting the adsorption efficiency, including the CTAC content, solution pH and ionic strength (I). When the content of CTAC on GAC increased from 0.031 to 0.16 mmol/g, the rate constant in the pseudo-second order reaction was decreased from 46.35 to 23.24 h.g/mmol, and the K value in the Freundlich equation was increased from 0.087 to 0.20 mmol/g correspondingly. Typically, GAC-CTAC exhibited a higher adsorption capacity than GAC, which highlighted the key role of CTAC. The optimum perchlorate removal by GAC or GAC-CTAC was observed at pH 2-3, equivalent to pH(pzc) determined by zeta potential measurement. The adsorption capacity of perchlorate onto GAC-CTAC at pH 2.5 (0.36 mmol/g) was 3.8 times as high as that onto GAC-CTAC at pH 5.6 (0.094 mmol/g). Ionic strength appeared to significantly inhibit the perchlorate adsorption on GAC-CTAC. Finally, our results demonstrated that the primary mechanisms for the adsorption of perchlorate on GAC-CTAC were associated with electrostatic interaction, surface complexation and ion exchange. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption, Cetyltrimethyl Ammonium Chloride, Contaminated Groundwater, Ion Exchange, Isotherm, Kinetics, Measurement, Perchlorate, pH, Primary, Pseudo-Second Order, Pseudo-Second-Order, Rate Constant, Reactor, Surfactant, Water

? Mahmoodi, N.M., Hayati, B., Arami, M. and Bahrami, H. (2011), Preparation, characterization and dye adsorption properties of biocompatible composite (alginate/titania nanoparticle). *Desalination*, **275** (1-3), 93-101.

Full Text: [2011\Desalination275, 93.pdf](2011/Desalination275,%2093.pdf)

Abstract: In this paper, the preparation, characterization and dye adsorption properties of novel biocompatible composite (Sodium Alginate/titania nanoparticle) (SA/n-TiO2) were investigated. Titania nanoparticles were immobilized onto Sodium Alginate. Physical characteristics of SA/n-TiO2 were studied using Fourier transform infrared (FT-IR), scanning electron microscopy (SEM), and wavelength dispersive X-ray spectroscopy (WDX). Two textile dyes, Direct Red 80 (DR80) and Acid Green 25 (AG25), were used as model compounds. The effect of operational parameter such as SA/n-TiO2 dosage, initial dye concentration and pH was evaluated at 25 degrees C. The isotherm, kinetic and thermodynamic of dye adsorption were studied. The data were evaluated for compliance with the different isotherm models. It was found that DR80 and AG25 followed with Langmuir isotherm. Adsorption kinetic of dyes was found to conform to pseudo-second order kinetics. The thermodynamic data showed that adsorption process was spontaneous, endothermic and physisorption reaction. Based on the data of present investigation, one could conclude that the SA/n-TiO2 being a biocompatible, eco-friendly and low-cost adsorbent might be a suitable alternative for elimination of dyes from colored aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid Dyes, Activated Carbon, Adsorption, Alginate, Titania Nanoparticle, Aqueous-Solutions, Biocompatible Composite, Characterization, Compliance, Dye Adsorption, Equilibrium, Gel Beads, Isotherm, Isotherm Models, Kinetics, Langmuir Isotherm, Linked Chitosan Beads, Model, Orange Peel, pH, Preparation, Pseudo-Second Order, Pseudo-Second-Order, Removal, Rice-Husk, Textile Dyes

? Dalida, M.L.P., Mariano, A.F.V., Futalan, C.M., Kan, C.C., Tsai, W.C. and Wan, M.W. (2011), Adsorptive removal of Cu(II) from aqueous solutions using non-crosslinked and crosslinked chitosan-coated bentonite beads. *Desalination*, **275** (1-3), 154-159.

Full Text: [2011\Desalination275, 154.pdf](2011/Desalination275,%20154.pdf)

Abstract: Batch experiments were executed to investigate the removal of Cu(II) from aqueous solutions using non-crosslinked (CCB) and crosslinked chitosan-coated (CCB-ECH) bentonite beads. CCB and CCB-ECH beads were characterized by BET surface area and pore diameter analysis and X-ray diffraction (XRD). The percentage removal and adsorption capacity of Cu(II) ions were examined as a function of initial concentration and pH. The equilibrium data of CCB agreed well with the Langmuir model while CCB-ECH beads showed a better fit with the Freundlich model. Based on the isotherm study, CCB is a homogenous adsorbent, whereas CCB-ECH is a heterogeneous adsorbent. The adsorption capacities of CCB and CCB-ECH at pH 4 are 12.21 and 9.43 mg/g, respectively. The kinetic data correlated well with the pseudo-second order equation, which implies that chemisorption is the rate-limiting step. The desorption study was performed using eluent solutions, tap water (pH 7) and HCl solution (pH 1 and pH 3). The best Cu(II) recovery was obtained using HCl solution (pH 1). (C) 2011 Elsevier BM. All rights reserved.

Keywords: Acid, Adsorption, Adsorption Isotherm, Bentonite, Chitosan, Copper Adsorption, Crosslinking, Cu(II), Desorption, Epichlorohydrin, Equilibrium, Hydrogel Beads, Ions, Isotherm, Langmuir Model, Lead, Mechanisms, Model, Montmorillonite, pH, Pseudo-Second Order, Pseudo-Second-Order, Sand

? Benyoucef, S. and Amrani, M. (2011), Adsorption of phosphate ions onto low cost Aleppo pine adsorbent. *Desalination*, **275** (1-3), 231-236.

Full Text: [2011\Desalination275, 231.pdf](2011/Desalination275,%20231.pdf)

Abstract: In the present study, chemically modified Aleppo pine sawdust was used for the removal of phosphate from water. Sorption of phosphate ions onto biosorbent was studied using the batch technique. The effect of different parameters such as contact time, adsorbate concentration, and temperature was investigated. The adsorption kinetics data were best described by the pseudo-second-order rate equation, and equilibrium was achieved after 40 min. The Langmuir and Freundlich equations for describing adsorption equilibrium were applied to data. The constants and correlation coefficients of these isotherm models were calculated and compared. The adsorption isotherms obey the Freundlich equation. The thermodynamic parameters like free energy, enthalpy, and entropy changes for the adsorption of phosphate ions have been evaluated, and it has been found that the reaction was spontaneous and endothermic in nature. The low value of activated energy of adsorption, 3.088 KJ mol-1, indicates that the phosphate ions are easily adsorbed on the sawdust. Results suggest that the prepared chemically modified Aleppo pine sawdust has potential in remediation of contaminated waters by phosphate. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Aleppo Pine, Equilibrium, Ions, Isotherm, Isotherm Models, Isotherms, Kinetics, Lignin, Media, Metal-Ions, Phosphate, Phosphorus Adsorption, Pseudo-Second-Order, Reactor, Removal, Sawdust, Sorption, Thermodynamic Parameters, Thermodynamics, Waste-Water

? Fukahori, S., Fujiwara, T., Ito, R. and Funamizu, N. (2011), pH-Dependent adsorption of sulfa drugs on high silica zeolite: Modeling and kinetic study. *Desalination*, **275** (1-3), 237-242.

Full Text: [2011\Desalination275, 237.pdf](2011/Desalination275,%20237.pdf)

Abstract: The adsorptive removal of five sulfa drugs (sulfathiazole, sulfamerazine, sulfamethizole, sulfadimidine and sulfamethoxazole) from an aqueous solution using a high-silica zeolite (HSZ-385) was investigated. pH greatly affected adsorption efficiency, and the amounts of all sulfa drugs adsorbed on HSZ-385 decreased at pH levels below and above their pK(a,1) and pK(a,2) values, respectively. We hypothesized that sulfa drugs in the neutral form would more readily adsorb onto HSZ-385 compared to those in the cationic and anionic forms, with adsorption predominately occurring via hydrophobic interactions. The Langmuir model was suitable for describing the adsorption of neutral sulfa drugs on HSZ-385, and a pH-dependent adsorption model was developed by considering the acid-base equilibria of the sulfa drugs. The calculated and experimental results corresponded well, strongly supporting our suggestion that the dominant adsorbed species was the neutral form and that the adsorption mechanism was based on hydrophobic interactions. Furthermore, the adsorption rate of the sulfa drugs on the zeolite was kinetically evaluated using a pseudo-second-order model, and a high adsorption rate was observed. The adsorption of sulfa drugs reached equilibrium within 15 min, indicating that HSZ-385 is a promising adsorbent for removing pharmaceuticals from aqueous media. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aquatic Environment, Aqueous-Solutions, Equilibrium, Human Pharmaceuticals, Langmuir Model, Liquid-Chromatography, Mass-Spectrometry, Model, Modeling, pH, Products, Pseudo-Second-Order, Sewage-Treatment Plants, Silica, Sorption, Sulfa Drugs, Sulfonamide Antibiotics, Waste-Water, Zeolite

? Soylak, M. and Yilmaz, E. (2011), Ionic liquid dispersive liquid-liquid microextraction of lead as pyrrolidinedithiocarbamate chelate prior to its flame atomic absorption spectrometric determination. *Desalination*, **275** (1-3), 297-301.

Full Text: [2011\Desalination275, 297.pdf](2011/Desalination275,%20297.pdf)

Abstract: A novel separation-preconcentration procedure based on ionic liquid dispersive liquid-liquid microextraction of traces lead as pyrrolidinedithiocarbamate chelate has been developed. 1-Hexyl-3-methylimidazolium hexafluorophosphate as ionic liquid was used for extraction of lead pyrrolidinedithiocarbamate chelate. After phase separation, the enriched analyte in the final solution is determined by flame atomic absorption spectrometry (FAAS). The effects of pH, amounts of ligand, amounts of 1-hexyl-3-methylimidazolium hexafluorophosphate, sample volume etc. on the recoveries of lead ions were investigated. The influences of some cations and anions on the recoveries of lead were also examined. The preconcentration factor was calculated as 40 at the sample volume of 20 ml. The detection limit for lead ions was 1.5 mu g/l. The validation of the presented method was performed by the analysis of TMDA-51.3 fortified water. The method was applied to natural water samples. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Lead, Flame Atomic Absorption Spectrometry, Ionic Liquid, 1-Hexyl-3-Methylimidazolium Hexafluorophosphate, Ammonium Pyrrolidinedithiocarbamate, Natural Waters, Solid-Phase Extraction, Optical Emission-Spectrometry, Multiwalled Carbon Nanotubes, Single-Drop Microextraction, Water Samples, Environmental-Samples, Metal-Ions, Activated Carbon, Trace Amounts, Online Preconcentration

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Full Text: [2011\Desalination276, 53.pdf](2011/Desalination276,%2053.pdf)

Abstract: Activated carbon prepared from the cones of the European Black pine was used as adsorbent for the removal of lead(II) ions from aqueous solutions. The effect of pH, initial concentration of lead( II) ions, contact time, and adsorbent dosage on the adsorption was studied in a batch process mode. Equilibrium data were analyzed by the Langmuir, Freundlich and Temkin isotherm model. Langmuir isotherm provided the best fit to the equilibrium data with maximum adsorption capacity of 27.53 mg/g. The kinetic data were found to follow closely the pseudo-second-order model. The microstructures of the activated carbon before and after adsorption of lead(II) ions were observed by scanning electron microscope. Textural analysis was employed in order to determine specific surface area and pore size distribution of the prepared activated carbon. Surface structure was characterized by using Fourier transform infrared spectroscopy and Boehm titration. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid, Activated Carbon, Adsorbent, Adsorption, Equilibrium, Freundlich, Heavy-Metals, Isotherm, Kinetic, Langmuir, Langmuir Isotherm, Lead(II), Lead(II) Ions, Methylene-Blue, Pb(II), pH, Pine Cones, Removal, Sawdust, Stones, Surface-Chemistry, Waste Biomass

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Full Text: [2011\Desalination276, 96.pdf](2011/Desalination276,%2096.pdf)

Abstract: Magnetic Ion Exchange Resin (MIEX (R)) is effective in removing the majority of organic carbon from biologically treated wastewater. It removed 77% of dissolved organic carbon (DOC) from synthetic wastewater when operated in batch mode using a MIEX (R) concentration of 10 mL/L. A pseudo second-order reaction rate model namely the Ho model was used for the kinetic study and it was found that it provided a realistic description of the adsorption kinetics of DOC. A fluidised bed MIEX (R) contactor effectively removed organic matter from synthetic biologically treated sewage effluent with more than 60% DOC removal even after 172 bed volumes. The regenerated MIEX (R) resin did not display any significant reduction in its ability to remove organic matter. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Coagulation, Constituents, Fluidised Bed Reactor, Ion-Exchange, Kinetic, Kinetic-Models, Kinetics, Magnetic, Magnetic Ion Exchange Resin (Miex (R)), Membranes, Microfiltration, Organic Removal, Pretreatment, Removal, Resin, Reuse, System, Waste-Water Treatment, Wastewater, Wastewater Reuse

? Zhang, H.B., Tong, Z.F., Wei, T.Y. and Tang, Y.K. (2011), Removal characteristics of Zn(II) from aqueous solution by alkaline Ca-bentonite. *Desalination*, **276** (1-3), 103-108.

Full Text: [2011\Desalination276, 103.pdf](2011/Desalination276,%20103.pdf)

Abstract: Zn(II) adsorption from aqueous solution on alkaline Ca-bentonite (ACB) was studied using batch technique and compared with the adsorption onto raw bentonite (RB). The percentage of Zn(II) removal increased with increasing adsorbent dosage, contact time and pH. The optimum initial pH for Zn(II) removal by RB and ACB was 7.0 and 4.0-7.0, respectively. The adsorption data from both RB and ACB experiments could be well-described by the pseudo-second-order kinetic model. The experimental data for Zn(II) adsorption on RB could be described by the Langmuir and Freundlich isotherms while those on ACB could be fit well to the Langmuir isotherm. Langmuir monolayer adsorption capacity of ACB (149 mg g-1) was found to be roughly two times greater than that of RB (73.5 mg g-1). Therefore, ACB is more effective than RB for Zn(II) adsorption from aqueous solution with respect to short equilibrium time, high efficiency and broad pH range. The equilibrium data, SEM and XRD analyses indicate that ACB removes Zn(II) from aqueous solution mainly by surface precipitation, cation exchange and fixation. In summary, the study suggests that ACB is very suitable for potential applications in Zn(II) removal from aqueous solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Alkaline Ca-Bentonite, Aqueous Solution, Batch Technique, Bentonite, Cadmium, Cation Exchange, Equilibrium, Freundlich, Freundlich Isotherms, Heavy-Metals, Ions, Isotherm, Isotherms, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Lead, Low-Cost Adsorbents, Natural Bentonite, pH, Removal, Removal Mechanism, SEM, Sorption, Zinc, Zinc Removal

? Mouni, L., Merabet, D., Bouzaza, A. and Belkhiri, L. (2011), Adsorption of Pb(II) from aqueous solutions using activated carbon developed from Apricot stone. *Desalination*, **276** (1-3), 148-153.

Full Text: [2011\Desalination276, 148.pdf](2011/Desalination276,%20148.pdf)

Abstract: Low-cost activated carbon was prepared from Apricot stone material by chemical activation with sulphuric acid for the adsorption of Pb(II) from dilute aqueous solution. The activated carbon developed shows substantial capacity to adsorb Pb(II) from dilute aqueous solutions. The parameters studied include physical and chemical properties of adsorbent, pH, adsorbent dose, contact time and initial concentrations. The percent removal increased with pH from 1.5 to 5. The optimum pH required for maximum adsorption was found to be 6.0. Adsorption kinetics data were modeled using the pseudo-first and pseudo-second-order models. The results indicate that the second-order model best describes adsorption kinetic data. The isotherm equilibrium data were well fitted by the Langmuir and Freundlich models. The estimated maximum capacities of lead ions adsorbed by Apricot stone activated with sulphuric acid were 21.38 mg g-1. The adsorbent derived from this material is expected to be an economical product for metal ion remediation from water and wastewater. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Apricot Stone, Aqueous Solution, Cadmium, Copper, Equilibrium, Freundlich, Heavy-Metal Ions, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir And Freundlich Models, Lead, Lead, Model, Pb(II), pH, Remediation, Removal, Sawdust, Sorption, Toxic Metal Removal, Waste-Water, Wastewater, Water, Zinc

? Wang, X.S., Zhu, L. and Lu, H.J. (2011), Surface chemical properties and adsorption of Cu(II) on nanoscale magnetite in aqueous solutions. *Desalination*, **276** (1-3), 154-160.

Full Text: [2011\Desalination276, 154.pdf](2011/Desalination276,%20154.pdf)

Abstract: Magnetite nanoparticles were applied to remove Cu (II) from aqueous solutions. The highly crystalline nature of the magnetite structure with a diameter of around 10 nm was characterized with transmission electron microscopy (TEM) and X-ray diffractometry (XRD). The surface area was determined to be 115.3 m2/g. Surface chemical properties of magnetite at 25ºC in aqueous suspensions were investigated. Batch experiments were carried out to determine the adsorption kinetics and mechanism of Cu (II) by these magnetite nanoparticles. The Cu (II) uptake was mainly governed by surface complexation adsorption. The adsorption process was found to be pH-dependent. The Cu (II) adsorption onto magnetite from NaCl and NaClO4 solutions (0.001 to 0.1 mol/L) revealed that Cu (II) adsorption behavior was a function of the concentration and type of supporting electrolyte. The adsorption process followed the pseudo-second order equation (r2 = 0.9876) and Fractional power equation (r2 = 0.9882) very well. The adsorption data fitted well with the Freundlich (r2 = 0.9938) and Langmuir isotherm (r2 = 0.9944) equations and the isothermal constants were calculated. Preliminary results indicate that magnetite nanoparticles may be used as an adsorbent for the removal of Cu (II) from wastewater. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Kinetics, Batch, Complexation, Cr(Vi), Cu (II), Electron Microscopy, Freundlich, Ions, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Mackinawite, Magnetite, Mechanism, Nanoparticles, Oxide, Reduction, Removal, Size, Sorption, Sorption, Uptake, Wastewater, Water

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Full Text: [2011\Desalination276, 161.pdf](2011/Desalination276,%20161.pdf)

Abstract: The effects of low molecular weight organic acids (LMWOAs) on the defluoridation capacity of nanosized hydrpxyapatite (nHAP) from aqueous solution were investigated. Defluoridation capacity of nHAP was enhanced in the presence of LMWOAs. The nHAP adsorbed LMWOAs on its surface, and the LMWOAs on nHAP were considered to be the newly formed active sites for fluoride adsorption. At low pH. the adsorbed LMWOAs were protonated, positively charged, and thus could attract fluoride anions by electrostatic attraction. Meanwhile, the protonated LMWOAs could also form hydrogen bonding with fluoride. At high pH, the LMWOAs on nHAP were deprotonated and existed as anions. These organic acid anions on nHAP could be exchanged with fluoride. It was evident that with increasing aqueous LMWOAs concentrations, the LMWOAs adsorbed onto nHAP increased, and subsequently the defluoridation capacity of the adsorbent increased. Results also indicated that the defluoridation capacity increased with increasing the contact time, while decreased with the increase of the adsorbent dose or solution pH. In the presence/absence of LMWOAs, the adsorption isotherms were well fitted by the Freundlich model (R(2)>0.98), and the sorption kinetics were well described by the pseudo-second-order model. Moreover, thermodynamic parameters indicated that the adsorption was spontaneous and endothermic. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Active, Adsorbent, Adsorption, Adsorption Isotherms, Aqueous Solution, Defluoridation, Defluoridation Capacity, Freundlich, Hydroxyapatite, Ions, Isotherms, Kinetics, Low-Molecular-Weight Organic Acids, Nanosized Hydroxyapatite, pH, Phosphate, Removal, Rp-Hplc, Solid-Phase Extraction, Sorption, Sorption Kinetics, Synthetic Hydroxyapatite, Thermodynamic, Thermodynamic Parameters, Waste-Water

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Full Text: [2011\Desalination276, 169.pdf](2011/Desalination276,%20169.pdf)

Abstract: The removal of the methylene blue from aqueous water by adsorption with defatted Jojoba has been studied in a batch operation mode. The percentages removal of dye increases with increasing contact time, Jojoba dosage and temperature achieving the equilibrium at 40 min. The maximum removal (80% approx.) has been achieved at 50ºC, 0.8 g/50 mL of Jojoba dosage, 200 mg/L initial concentration of MB and the pH range between 6.2 and 6.8. The dynamic isotherm has been successfully modeled by the Langmuir with R(2)=0.98. The negative thermodynamic parameters ΔG (-14.4, -15.4, -16.8) at 25, 35, 40 and 50 degrees C, respectively indicate spontaneous adsorption. The pseudo-second order kinetic model is much more reasonable for MB adsorption process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous Solution, Basic Dye, Batch Adsorption, Degradation, Dye, Equilibrium, Isotherm, Jojoba, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Mb Adsorption, Methylene Blue, Natural Zeolite, Olive Cake, pH, Pseudo-Second Order, Reactive Dyes, Removal, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Waste, Water

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Full Text: [2011\Desalination276, 246.pdf](2011/Desalination276,%20246.pdf)

Abstract: Natural zeolite was chemically modified using calcium chloride to enhance its fluoride removal capability. Batch adsorption experiments were conducted to examine and optimize various operational conditions such as adsorbent dose, contact time, pH, effect of co-ions, and initial fluoride concentrations. Maximum fluoride adsorption capacity of CaCl2 modified-zeolite (CZ) was 1.766 mg g-1 at an initial fluoride concentration of 100 mg L-1. Kinetic study reveals that the fluoride adsorption by CZ follows both pseudo-second order kinetic and intra-particle diffusion models. The experimental data fitted well to both Langmuir and Freundlich adsorption isotherm. The ΔG(0) and ΔH(0) values suggest that the fluoride adsorption by CZ is spontaneous and endothermic in nature. Studies were also performed to understand the effect of some co-existing anions present in aqueous solutions. Results of this study demonstrated the effectiveness and feasibility of CZ for removal of fluoride ions from aqueous solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Isotherm, Aqueous Solution, Aqueous-Solution, Batch, Batch Adsorption, Calcium, Calcium Chloride, Chloride, Diffusion, Drinking-Water, Fluoride Adsorption, Fluoride Removal, Freundlich, Isotherm, Kinetic, Kinetics, Langmuir, Low-Cost Materials, Montmorillonite, Natural Zeolite, pH, Removal, Sludge, Sorption, Wastewater, Zeolite

? Subbaiah, M.V., Vijaya, Y., Reddy, A.S., Yuvaraja, G. and Krishnaiah, A. (2011), Equilibrium, kinetic and thermodynamic studies on the biosorption of Cu(II) onto *Trametes versicolor* biomass. *Desalination*, **276** (1-3), 310-316.

Full Text: [2011\Desalination276, 310.pdf](2011/Desalination276,%20310.pdf)

Abstract: The ability of Trametes versicolor biomass for biosorption of Cu(II) ions from aqueous solution was studied in batch experiments. The effect of relevant parameters such as function of pH, biomass dosage, contact time, initial metal ion concentration and temperature was evaluated. Further, the biosorbent was characterized by using Fourier Transform Infrared Spectroscopy (FTIR) and BET Surface area analysis. Experimental data were analyzed in terms of pseudo-first order, pseudo-second order and intraparticle diffusion kinetic models. The results showed that the biosorption process of Cu(II) ions followed well pseudo-second order kinetics. The biosorption data of Cu(II) ions at 303, 313 and 323 K are fitted to Langmuir, Freundlich, Dubinin-Radushkevich (D-R) and Temkin isotherms. Biosorption of Cu(II) onto T. versicolor biomass followed the Langmuir isotherm model (R2 = 0.999) with the maximum biosorption capacity of 140.9 mg/g. The calculated thermodynamic parameters such as ΔG, ΔH and ΔS showed that the biosorption of Cu(II) ions onto T. versicolor biomass was feasible, spontaneous and endothermic at 303-323 K. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aqueous Solution, Aqueous-Solutions, Aspergillus-Niger, Basic Dye, Biosorbent, Biosorption, Cadmium Removal, Copper Ii, Cu(II), Diffusion, Equilibrium, Freundlich, FTIR, Heavy-Metal Biosorption, Ions, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Pb(II), pH, Phanerochaete-Chrysosporium, Surface Area, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Trametes Versicolor

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Full Text: [2011\Desalination276, 322.pdf](2011/Desalination276,%20322.pdf)

Abstract: Three samples of aluminum-based water treatment residuals (Al-WTR1, Al-WTR2, and Al-WTR3) were assessed as adsorbent for boron removal. The Al-WTRs were mainly composed of Al2O3, Fe2O3, and SiO2. The adsorption reaction could be approximated by a pseudo-second-order kinetic model. The equilibrium pH (pH(e)) affected boron adsorption and the optimum pH(e) was found at 8.2-8.5. The Langmuir model described the adsorption data satisfactorily (R2 value average ≥ 0.990), and the batch maximum adsorption capacities were found as 0.980, 0.700, and 0.190 mg/g using three samples, respectively, at pH value of 8.3±0.2. Thermodynamic analysis revealed that the adsorption reaction was spontaneous and exothermic. The ΔH degrees value was low (-1.58 kJ/mol), and that was indicative of a physical adsorption. Electrostatic interactions and van der Waals force were proposed as major driving forces of adsorption under different pH conditions. Both BET specific surface area and aluminum content of Al-WTRs affected boron adsorption, as judged by the fact that Al-WTR1 showed higher adsorption density than the other two. The results of this study show that Al-WTRs can be used as an alternative adsorbent for boron removal. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Aluminum-Based Water Treatment Residuals (Al-WTRS), Aqueous-Solutions, Batch, Boron, Design, Equilibrium, Kinetic, Kinetic Model, Langmuir, pH, Removal, Thermodynamic, Wastewater, Water

? Mona, S., Kaushik, A. and Kaushik, C.P. (2011), Sequestration of Co(II) from aqueous solution using immobilized biomass of *Nostoc linckia* waste from a hydrogen bioreactor. *Desalination*, **276** (1-3), 408-415.

Full Text: [2011\Desalination276, 408.pdf](2011/Desalination276,%20408.pdf)

Abstract: The study was conducted to explore the potential of spent biomass of a hydrogen producing cyanobacterium, Nostoc linckia for removal of Co(II) from aqueous solution. The biomass waste generated from a lab-scale hydrogen bioreactor was immobilized in calcium alginate and used as a biosorbent. Kinetic studies indicated that biosorption of Co(II) on the cyanobacterial biomass followed pseudo second order model with an equilibrium time of 125 min. Response surface methodology (RSM) was used to design experiments for optimization of pH (1.0-6.0), temperature (25-45ºC) and initial metal concentration (10-100 mg/L) for achieving maximum removal of Co(II) by the biosorbent. The data was fitted to a second-order polynomial equation and highly significant regression coefficients confirmed that the model could be applied for obtaining the desired response within the design range using the present biosorbent. The response surface data showed a maximum of 97% metal removal at pH 3.5 and 25ºC temperature at initial metal concentrations of 10 mg/L (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Alginate, Aqueous Solution, Batch, Biosorbent, Biosorption, Biosorptive Removal, Calcium, Calcium Alginate, Co(II), Cobalt, Cobalt, Column, Copper, Equilibrium, Immobilized, Kinetic, Marine Alga, Microalgae, Nostoc Linckia, Optimization, pH, Removal, Response Surface Methodology, Sorption, Spent Biomass, Temperature, Waste, Water

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Full Text: [2011\Desalination277, 15.pdf](2011/Desalination277,%2015.pdf)

Abstract: This paper focuses on the effectiveness of removing ammonium ion and the theoretical aspects of adsorption including adsorption isotherm, kinetics and thermodynamics as well as desorption-regeneration studies. Results have demonstrated that natural zeolite shows good performance with up to 97% for ammonium removal depending on contact time, zeolite loading, initial ammonium concentration and pH. The adsorption kinetics is best approximated by the pseudo-second-order model, whereas the adsorption isotherm results indicated that Freundlich model provides the best fit for the equilibrium data. Furthermore, with regard to thermodynamic parameters. it was found that Gibbs free energy change or adsorption energy (Δ*G*º), -19.52 kJ/mol at 25ºC, -20.45 kJ/mol at 35ºC and -22.91 kJ/mol at 45ºC is negative indicating the spontaneous nature of the adsorption process, whereas the enthalpy change (Δ*H*º), 30.96 kJ/mol is positive indicating endothermic adsorption process. The entropy change (Δ*S*º), 0.169 kJ/(mol K) at 25ºC is also positive indicating increasing randomness at the solid-solution interface during adsorption. In addition, the desorption-regeneration studies demonstrated that desorption of ammonium on the zeolite is sufficiently high using NaCl solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Ammonium, Ammonium Removal, Aqueous-Solution, Australian Zeolite, Clinoptilolite, Desorption, Equilibrium, Freundlich, Ion-Exchange Properties, Isotherm, Kinetics, Natural Zeolite, pH, Phenol, Removal, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water, Wastewaters, Zeolite

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Full Text: [2011\Desalination277, 46.pdf](2011/Desalination277,%2046.pdf)

Abstract: In this study, zeolites are synthesized from low-calcium (LC-Z) and high-calcium (HC-Z) fly ashes, respectively. The changes of mineralogy, morphology, cation exchange capacity (CEC) and specific surface area (SSA) are investigated during the synthesis process. The equilibrium uptake of ammonium on the two synthesized zeolites is compared. The main crystals of LC-Z and HC-Z are identified as faujasite and gismondine, respectively. The CEC and SSA increase significantly following the conversion process. The kinetic studies showed that the adsorption process of ammonium on both LC-Z and HC-Z follows Ho’s pseudo-second-order model. Langmuir model agrees better with the equilibrium data for LC-Z, while Freundlich model gives the better fit for HC-Z. The obtained maximum ammonium uptake capacities are 23.8 mg/g for LC-Z and 3.17 mg/g for HC-Z in the synthetic solution. LC-Z also exhibits much better performance in ammonium uptake in effluent from a sewage treatment plant than HC-Z. These results indicate that LC-Z is a promising material for ammonium removal whereas HC-Z is not. The Ca2+ leaching and the lower zeolite content in HC-Z account for its lower uptake capacity. Thus, the low-calcium fly ash should be chosen preferentially as the raw material of the zeolite synthesis for ammonium removal. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Ammonium, Ammonium Removal, Aqueous Solution, Cation Exchange, Clinoptilolite, Equilibrium, Fly Ash, Freundlich, High-Calcium Fly Ash, Ion-Exchange Uptake, Kinetic, Langmuir, Low-Calcium Fly Ash, Removal, Select Criteria Of Raw Fly Ash, Synthesized Zeolite, Uptake, Waste-Water, Zeolite

? Yilmaz, A.E., Boncukcuoglu, R., Kocakerim, M. and Karakas, I.H. (2011), Waste utilization: The removal of textile dye (Bomaplex Red CR-L) from aqueous solution on sludge waste from electrocoagulation as adsorbent. *Desalination*, **277** (1-3), 156-163.

Full Text: [2011\Desalination277, 156.pdf](2011/Desalination277,%20156.pdf)

Abstract: The potential of removing Bomaplex Red CR-L dye from electro coagulation sludge has been investigated for different Bomaplex Red CR-L concentrations with varying adsorbent amount, temperature, pH and stirrer speed. Removal of Bomaplex Red CR-L is found to be high at lower pH values. The maximum adsorption of the dye has been achieved in aqueous solutions using 0.5 g of calcinated sludge from electro coagulation at a pH of 2.0 within 20 min. The Langmuir and Freundlich isotherm models were tested and it was found that the Langmuir equation was fitted better than the Freundlich equation. Maximum adsorption capacity (*q*m) was calculated as 192.31 mg g-1 at 333 K. In addition, the adsorption data obtained at various temperatures were successfully applied to pseudo first-order, pseudo second-order and intraparticle diffusion models. The rates of adsorption were found to conform to pseudo second-order kinetics with good correlation (R2 ≥ 0.9997). This study showed that calcinated the sludge from electrocoagulation has a highly adsorbent capacity. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Aqueous Solution, Diffusion, Dye, Dye Removal, Equilibrium, Freundlich, Freundlich Isotherm, Isotherm, Isotherms, Kinetics, Kinetics, Langmuir, Methyl Violet, Perlite, pH, Reactive Dyes, Removal, Temperature, Waste, Waste Utilization, Wastewater

? Chen, J.H., Lin, H., Luo, Z.H., He, Y.S. and Li, G.P. (2011), Cu(II)-imprinted porous film adsorbent Cu-PVA-SA has high uptake capacity for removal of Cu(II) ions from aqueous solution. *Desalination*, **277** (1-3), 265-273.

Full Text: [2011\Desalination277, 265.pdf](2011/Desalination277,%20265.pdf)

Abstract: In this study, we prepared Cu(II)-imprinted porous film adsorbent Cu-PVA-SA and used it for adsorption Cu(II) ions from aqueous solution. The Cu-PVA-SA can be conveniently used without centrifugation or filtration methods. Copper adsorption on the surface of the Cu-PVA-SA was proved by FT-IR, SEM and EDX. To investigate the effects of experimental parameters on adsorption behavior, we performed a batch of experiments by changing the concentration of Cu(II) ions in the Cu-PVA-SA, the pH of the solution, contact time, adsorbent dosage, ionic strength and initial Cu(II) ion concentration. Our Cu-PVA-SA showed the maximum uptake of 79.3 mg/g under the optimal adsorption condition and has significantly higher uptake than that of nonimprinted PVA-SA. Interestingly, we found the uptake of the Cu-PVA-SA for Cu(II) ions decreased with an increasing of ionic strength, and the pH of the solution decreased with the increase of contact time until the adsorption equilibrium. Competitive adsorption studies for the binary system Cu(II)/Zn (II) and Cu(II)/Cd(II) suggested that the adsorption of Cu-PVA-SA for Cu(II) ions was preferable to Cd(II) and Zn(II) ions. Kinetics experiments indicated the pseudo-second-order model displayed the best correlation with our data. Besides, our equilibrium data could be better described by the Freundlich isotherm model. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Aqueous Solution, Biosorbent, Biosorption, Cd(II), Chromium(VI), Competitive Adsorption, Copper, Copper Adsorption, Cu(II), Equilibrium, Film, Freundlich, Freundlich Isotherm, FT-IR, FTIR, Hollow-Fiber Membranes, Ionic Imprinting, Ionic Strength, Isotherm, Kinetics, pH, Removal, Sawdust, SEM, Separation, Sodium Alginate, Sorption, Uptake, Waste-Water

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Full Text: [2011\Desalination277, 288.pdf](2011/Desalination277,%20288.pdf)

Abstract: In this study, poly-hydroxyl iron/zirconium pillared montmorillonites have been utilized as adsorbents for the removal of Cu-EDTA chelates from aqueous solutions. Batch experiments were conducted to examine the effects of solution pH, initial concentration, contact time, temperature, ionic strength and coexisting ions on the Cu-EDTA removal. The results demonstrated that the uptake of Cu-EDTA on the pillared montmorillonites maintained high-efficiency in the pH range of 3.0-9.0. The adsorption data was found to fit well the Freundlich isotherm equation with R2 above 0.99 and followed the Pseudo-second-order model with a short equilibrium time of 30 min. The Cu-EDTA removal decreased slightly as temperature increased from 25ºC to 45ºC and ionic strength varied from 0.001 M to 0.05 M. The presence of phosphate and tartaric significantly reduced the adsorption of Cu-EDTA and the effects of the coexisting ions followed the order: C(4)H(4)O(6)(2-) > PO(4)(3-) > SO(4)(2-) > CH(3) (CH(2))(11)SO(3)(->)NO(3)(-). Furthermore, Electron paramagnetic resonance (EPR) results revealed different adsorption mechanisms involved in acidic and basic solutions. The spectroscopy data together with the macroscopic adsorption results suggested that the adsorption process of Cu-EDTA on pillared montmorillonites involved electrostatic interaction and also an inner-sphere complexation which could include several complexation patterns. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Batch, Clays, Complexation, Cu(II), Cu-EDTA, EPR, Equilibrium, Fe, Freundlich, Freundlich Isotherm, Ionic Strength, Ionic-Strength, Isotherm, Metal-Ions, Montmorillonite, pH, Phosphate, Pillared Clays, Removal, Sorption, Temperature, TiO2, Uptake, Waste-Water, Water-Treatment, XPS

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Full Text: [2011\Desalination277, 390.pdf](2011/Desalination277,%20390.pdf)

Abstract: The sorption of Cu(II) onto waste residue left after extraction of juice from Indian gooseberry (Amla) fruit (*Emblica officinalis*) was studied. Equilibrium isotherms, kinetic data and thermodynamic parameters have been evaluated. Equilibrium data agreed well with Langmuir, Freundlich, Temkin and Dubinin-Radushkevich (D-R) isotherm models. The kinetic data followed pseudo-second-order model and it was found that intra-particle diffusion was not the sole rate-controlling factor. Gibbs free energy showed spontaneous process for all interactions. The breakthrough and exhaustive capacities were found to be 4.0 and 24.0 mg/g respectively. *Emblica officinalis* was shown to be a promising sorbent for Cu(II) removal from aqueous solutions. The practical utility of the sorbent has been demonstrated by achieving 97.60% removal of Cu(II) from electroplating wastewater by column process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorptive Removal, Aqueous-Solution, Biosorption, Cadmium(II), Copper(II) Ions, Cu(II), Diffusion, Equilibrium, Equilibrium Isotherms, Freundlich, Industry Waste, Isotherm, Isotherms, Kinetic, Kinetics, Kinetics, Langmuir, Nickel Ions, Removal, Sorbent, Sorption, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste, Wastewater

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Full Text: [2011\Desalination278, 1.pdf](2011/Desalination278,%201.pdf)

Abstract: In this study, the adsorption potential of Brushite for the removal of fluoride from aqueous solution has been investigated by using batch mode experiments. The effects of different parameters such as pH, adsorbent dosage, initial fluoride concentration, contact time, temperature and co-existing ions have been studied to understand the adsorption behavior of the adsorbent under various conditions. The adsorbent has been characterized by pHpzc measurement, FTIR. XRD and TEM with EDAX analysis. The Langmuir Freundlich, and Temkin models are found to be the best to describe the equilibrium isotherm data, with a maximum monolayer adsorption capacity of 6.59 mg g-1 at 310 K. Thermodynamic parameters including the Gibbs free energy ΔGº, enthalpy ΔHº, and entropy ΔSº have revealed that the adsorption of fluoride ions on the Brushite is feasible, spontaneous and endothermic. Among the kinetic models tested for Brushite, pseudo-second-order model fits the kinetic data well. It has been found that the adequate time for the adsorption equilibrium of fluoride is only 60 min. The results of this study have demonstrated the effectiveness and feasibility of Brushite for the removal of fluoride ions from aqueous solution. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption, Aqueous Solution, Aqueous-Solutions, Brushite, Defluoridation, Equilibrium, Fluoride, Fluoride Removal, Freundlich, FTIR, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, pH, Pore, Pseudo Second Order, Removal, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Water

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Full Text: [2011\Desalination278, 18.pdf](2011/Desalination278,%2018.pdf)

Abstract: Removal of Ca(II) from aqueous solutions was potentially achieved using two new naturally benign sorbents. They were obtained via modification of sugar cane bagasse (SCB) with tartaric acid (TA) and citric acid (CA) using microwave-assisted solvent-free synthesis. The highest percentages of surface loading were realized under optimize conditions of mass ratio of SCB and TA or CA, microwave radiation power and time of radiation. Changes in spectral band positions of binding sites of SCB and its modified forms (SCB-TA and SCB-CA) were characterized using FT-IR before and after calcium ions sorption. Also, changes in surface morphology were explored in parallel, using scanning electron microscope (SEM). Moreover, for obtaining maximum Ca(II) removal, batch experiments were carried out at different parameters including hydrogen ion concentration, initial Ca(II) concentrations, mass of the sorbent and finally shaking times. Results of sorption isotherms were better fitted with the Langmuir model (r2 = 0.959 and 0.995 for SCB-TA and SCB-CA, respectively). In addition, the kinetics data were best fitted with the pseudo-second-order type. Applications of the new natural sorbents for lowering hardness and consequently conductivity and total dissolved solids (TDS) in different water samples was superior compared to the cation exchange resin Dowex 50W-X8. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Agricultural Waste, Atomic-Absorption-Spectrometry, Beet Pulp, Ca(II), Calcium, Cation Exchange, Citric, Drinking-Water, FT-IR, FTIR, Heavy-Metal Ions, Isotherms, Kinetics, Langmuir, Magnesium, Microwave, Natural Water Samples, Natural-Water Samples, Pseudo Second Order, Radiation, Removal, Resin, Selective Separation, SEM, Solid-Phase Extractors, Sorbent, Sorption, Sorption Isotherms, Sugar Cane Bagasse, Tartaric, Water

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Full Text: [2011\Desalination278, 238.pdf](2011/Desalination278,%20238.pdf)

Abstract: The 3-[2-(2-aminoethylamino)ethylamino]propyl-trimethoxysilane(AAAPTS) functionalized silica gel (AAAPTS/SiO2) was synthesized and used as a potential adsorbent for the As(V) removal from aqueous solutions. AAAPTS/SiO2 was characterized by IR, nitrogen adsorption and point of zero charge (pH,) measurements. The adsorption behaviors of As(III) and As(V), adsorption isotherms and dynamics of As(V) on AAAPTS/SiO2 adsorbent were investigated. It was found that As(V) could be selectively adsorbed on AAAPTS/SiO2 adsorbent within pH of 2.7-9.2, while As(III) could not be absorbed in the studied pH range. Equilibrium data fitted perfectly with Langmuir isotherm model compared to Freundlich isotherm model, and the maximum adsorption capacity was 13.9 mg.g-1 for the AAAPTS/SiO2 adsorbent. Kinetic studies indicated that sorption followed a pseudo-second-order model. The results showed that AAAPTS/SiO2 adsorbent could be employed as an effective material for the removal of As(V) from aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: 3-[2-(2-Aminoethylamino)Ethylamino]Propyl-Trimethoxysilane Removal, Activated Carbons, Adsorbent, Adsorption, Adsorption Isotherms, Arsenic, As(III), As(V), As(V) Removal, Equilibrium, Freundlich, Freundlich Isotherm, Iron, Isotherm, Isotherms, Kinetic, Langmuir, Langmuir Isotherm, Mesoporous Silica, pH, Pseudo Second Order, Removal, Silica, Silica Gel, Sorbent, Sorption, Toxicity, Water

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Full Text: [2011\Desalination278, 231.pdf](2011/Desalination278,%20231.pdf)

Abstract: Sewage sludge-based activated carbons were prepared with microwave-induced activation process using phosphoric (SP) or zinc chloride (SZ) as the chemical activating agents. The physicochemical properties of the carbons were carried out. The effectiveness of the carbons prepared in adsorption of Cu(II) has been studied as a function of pH, agitation time and temperature. The results showed that the adsorption of Cu(II) onto SP and SZ was maximal at about pH 5.0. The rates of adsorption were found to conform to the pseudo-second-order kinetic model. The intra-particle diffusion was identified to be the rate-limiting step. Langmuir isotherm showed better fit than Freundlich isotherm for all activated carbon samples and the maximum adsorption capacities of Cu(II) were 7.73 and 10.56 mg/g for SP and SZ, respectively. The thermodynamics parameters such as ΔG(0), ΔH(0), ΔS(0) were also evaluated. The SZ carbon was found to be both effective and economically viable. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbents, Adsorption, Aqueous-Solutions, Biosorption, Chemical Activation, Chloride, Copper, Cu(II), Diffusion, Dye, Equilibrium, Freundlich, Freundlich Isotherm, Heavy Metal, Heavy-Metal Ions, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Microwave, pH, Phosphoric Acid, Pseudo Second Order, Sewage Sludge, Temperature, Thermal Regeneration, Thermodynamics, Waste, Zinc

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Full Text: [2011\Desalination278, 303.pdf](2011/Desalination278,%20303.pdf)

Abstract: This study examined kinetics and mass transfer in the biosorption of heavy metals onto Caulerpa lentillifera. The sorption capacity of Cu2+, Pb2+ and Cd2+ from aqueous solution increased with initial metal concentration and decreased with biosorbent dose. Kinetic data were well described using the pseudo-second-order model. Results showed that both external mass transfer and intraparticle diffusion were rate limiting steps in the biosorption process. Activation energy of biosorption kinetics fell in the range of 313 kJ/mol. The biosorption of Cu2+, Cd2+ and Pb2+ on the biomass correlated well with the Langmuir isotherm (R2> 0.99) with maximum sorption capacities at 293 K of 0.169, 0.085 and 0.177 mol/kg for Cu2+, Cd2+ and Pb2+ ions, respectively. Thermodynamic studies demonstrated that the biosorption process was spontaneous and endothermic under conditions. The results were analyzed to determine external mass transfer coefficient which was proved to be related to the rate constant of Langmuirian kinetic model. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activation Energy, Adsorption, Aqueous Solution, Biosorbent, Biosorption, Copper, Diffusion, Equilibrium, Equilibrium, Green Macroalga, Heavy Metals, Heavy-Metals, Ions, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Pseudo Second Order, Removal, Sorption, Sorption Kinetics, Surface, Thermodynamic, Thermodynamic Studies, Wastewater Treatment, Water

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Full Text: [2011\Desalination278, 412.pdf](2011/Desalination278,%20412.pdf)

Abstract: Immobilized eggshell with a polymer mixture of alginate and polyvinyl alcohol was applied as a biocomposite adsorbent (ESC) for the adsorption of C.I. Remazol Reactive Red 198 from aqueous solution. ESC was characterized using XRD, TGA, FTIR and SEM. The Red dye adsorption onto the ESC was investigated in a batch system with respect to initial dye concentration, pH, contact time, agitation speed, solution temperature and biocomposite dosage. The prepared biocomposite exhibits high efficiency for red dye adsorption and the equilibrium states could be achieved in 3 h for the different studied initial dye concentrations. The equilibrium isotherm study indicated that sorption data were analyzed and fitted well by both Langmuir and Temkin models compared to Freundlich model. The maximum monolayer dye adsorption capacity (at the optimum pH 1.0) was estimated to be 46.9 mg/g at 22ºC. The kinetic study revealed that pseudo-second order model fitted well the kinetic data, while both the intraparticle diffusion and Boyd kinetic model indicated that intraparticle diffusion was the main rate determining step in the biosorption process. The negative values of both the enthalpy (Δ*H*º) and Gibbs free energy (Δ*G*º) changes indicate exothermic as well as feasible and spontaneous nature of the biosorption process respectively. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid Dye, Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Alginate, Aqueous Solution, Aqueous-Solutions, Basic Dye, Biosorption, Biosorption, CI Remazol Reactive Red 198, Diffusion, Dye, Dye Adsorption, Eggshell, Eggshell Biocomposite, Equilibrium, Equilibrium Isotherms, Freundlich, Ftir, Immobilization, Immobilized, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Methylene-Blue, pH, Pseudo Second Order, Removal, SEM, Sorption, Temperature, Textile Dyes, Thermodynamic, Waste Water Treatment, Waste-Water

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Full Text: [2011\Desalination279, 54.pdf](2011/Desalination279,%2054.pdf)

Abstract: This paper investigated the adsorption behavior of toluenediamine on activated carbon in batch and fixed bed systems, respectively. The adsorption isotherms could be well fitted by the Langmuir adsorption equation and the kinetics of adsorption followed the pseudo-second-order model. The thermodynamic parameters for the process of adsorption have been estimated and the results indicated the physical, exothermic and spontaneous nature of adsorption. With the adsorption equilibrium constant and the kinetics of adsorption determined from separate experiments in the batch reactor, the design parameters of the fixed bed column were evaluated by the experiments. Based on this analysis, the overall liquid-phase volumetric mass-transfer coefficient of the fixed bed (K(F)alpha(v)) was calculated from the nonlinear wave propagation theory and Weber’s theory. It also suggested that the overall liquid-phase volumetric mass-transfer coefficient of the fixed bed was independent of the bed depth but increased with feed flow rate. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherms, Aniline, Batch, Equation, Equilibrium, Fixed Bed Column, Ions, Isotherms, Kinetics, Langmuir, Nonlinear, Orange, Peel, Pseudo Second Order, Removal, Thermodynamic, Thermodynamic Parameters, Toluenediamine, Toxicity, Wastewater

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Full Text: [2011\Desalination279, 61.pdf](2011/Desalination279,%2061.pdf)

Abstract: In this paper, silica nanoparticle (SN) and amine-functionalized silica nanoparticle (AFSN) were prepared and their dye removal abilities were investigated. Physical characteristics of adsorbents were studied using the point of zero charge, surface area, Fourier transform infrared (FTIR) and scanning electron microscopy (SEM). Three textile dyes, Acid Red 14 (AR14), Acid Black 1 (AB1) and Acid Blue 25 (AB25), were used as model compounds. The effect of operational parameter such as adsorbent dosage, pH, dye concentration and salt were evaluated. The isotherm and kinetic of dye adsorption were studied. The maximum dye adsorption capacity (Q0) of SN for AR14, AB1 and AB25 was 0.031 mg/g, 0.034 mg/g and 0.170 mg/g, respectively. But the maximum dye adsorption capacity of AFSN for AR14, AB1 and AB25 was 434 mg/g, 250 mg/g and 167 mg/g, respectively. It was found that dye adsorption onto SN and AFSN followed with Freundlich and Langmuir isotherms, respectively. Adsorption kinetic of dyes was found to conform to pseudo-second order kinetics. Based on the data of present investigation, one could conclude that the AFSN being an eco-friendly adsorbent with high dye adsorption capacity might be a suitable alternative to remove dyes from colored aqueous solutions. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid Blue 25, Adsorbent, Adsorption, Adsorption Behavior, Adsorption Kinetic, Amine Functionalized, Amine-Functionalized Silica Nanoparticles, Aqueous-Solutions, Characterization, Chitosan, Dye, Dye Adsorption, Dye Removal, Dyes, Electron Microscopy, Freundlich, Freundlich And Langmuir Isotherms, FTIR, Fundamental Properties, Gel, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherms, Mesoporous Silicas, pH, Preparation, Pseudo Second Order, Reactive Dyes, Red, Removal, SEM, Silica, Sulfonated Azo Dyes, Textile Waste-Water

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Full Text: [2011\Desalination279, 183.pdf](2011/Desalination279,%20183.pdf)

Abstract: In this paper, the oxidation of dyes from colored textile wastewater by activated carbon (AC)/hydrogen peroxide H2O2) was discussed. Acid Red 18 (AR18), Direct Red 80 (DR80) and Reactive Red 194 (RR194) were used as model dyes. The surface characteristics of AC were investigated using Fourier transform infrared (FTIR). Dye oxidation by AC/H2O2 was studied by UV-Vis spectrophotometer and Ion chromatography (IC). The effects of AC dosage, initial dye concentration, pH and salt on dye oxidation were evaluated. Kinetics analysis indicated that the dye oxidation rates could be approximated at pseudo-second order model. Formate anion was detected as dominant aliphatic intermediate. Results indicated that the AC/H2O2 could be used as an eco-friendly material to degrade dyes from colored wastewater. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Ac, H2O2, Activated Carbon, Aliphatic Intermediate, Aqueous-Solutions, Carbon, Colored Wastewater, Degradation, Desulfurization, Dye, Dye Oxidation, Dyes, Formic-Acid, FTIR, GAC Adsorption Treatment, H2O2, Hydrogen-Peroxide, Kinetic, Kinetics, Organic Contaminants, pH, Pseudo Second Order, Removal, Wastewater

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Full Text: [2011\Desalination280, 87.pdf](2011/Desalination280,%2087.pdf)

Abstract: Heavy metal ion contamination in drinking water poses a major risk to human health, whilst contamination in wastewater streams can cause damage to the wider environment. in this study carbon nanocages, synthesised using a supercritical fluid deposition method, were examined as adsorbents of Pb2+ ions from aqueous solutions. Through careful selection of the catalyst and the carbon deposition temperature and pressure, high yields of nanocages with surface areas up to 1175 m2 g-1 were synthesised. These high surface area materials were subsequently tested for their ability to absorb Pb2+ ions, as a function of pH. from simulated wastewater. The nanocages were found to be effective at removing the Pb2+ ions at levels of 11.1 mg g-1, compared to 7.6 mg g-1 for commercially available activated carbon. The kinetics of metal ion adsorption by the nanocages and activated carbon can be described by a pseudo-second-order kinetics model, with a rate coefficient (k2) of 4.8 x 102 g mg-1 min-1. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption, Aqueous-Solution, Carbon, Chromium, Coconut Shell, Equilibrium, High-Surface-Area, Kinetics, Lead, Lead Ions, Nanocages, Nanotubes, pH, Remediation, Removal

? Huang, R.H., Wang, B., Yang, B.C., Zheng, D.S. and Zhang, Z.Q. (2011), Equilibrium, kinetic and thermodynamic studies of adsorption of Cd(II) from aqueous solution onto HACC-bentonite. *Desalination*, **280** (1-3), 297-304.

Full Text: [2011\Desalination280, 297.pdf](2011/Desalination280,%20297.pdf)

Abstract: A novel adsorbent was prepared using bentonite modified with N-2-hydroxypropyl trimethyl ammonium chloride chitosan (HACC), which was named as HACC-bentonite. It was characterized by Fourier-transform infrared spectroscopy (FTIR), X-Ray Diffractomer (XRD) and Scanning electron microscopy (SEM). Cadmium is one of the toxic metals and has received a great deal of attention. The adsorption of Cd(II) onto HACC-bentonite was examined in aqueous solution with respect to the pH, adsorbent dosage, contact time, temperature and initial concentration. Langmuir, Freundlich and Temkin isotherms were employed to describe adsorption equilibrium. The maximum amount of Cd(II) adsorbed (q(m),), as evaluated by Langmuir isotherm, was 22.23 mg per gram of HACC-bentonite at pH 7 0 or so and 20°C. The Lagergren-first-order and pseudo-second-order models were used to describe the kinetic data. The experimental data fitted well the pseudo-second-order kinetics. Furthermore, thermodynamic parameters, free energy (ΔG(0)), enthalpy (ΔH(0)) and entropy (ΔS(0)) of adsorption were also calculated. These parameters showed that the adsorption of Cd(II) onto HACC-bentonite was feasible, spontaneous and an endothermic process in nature. The change of adsorption enthalpy indicated that the adsorption of Cd(II) onto HACC-bentonite may be carried out via cation exchange. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Bentonite, Cadmium, Cd(II), Chemical Precipitation, Equilibrium, FTIR, HACC, Heavy-Metal Ions, Isotherm, Kaolinite, Kinetics, Langmuir, pH, Removal, Sorbent, Sorption, Ultrafiltration, Waste-Water

? Karakoyun, N., Kubilay, S., Aktas, N., Turhan, O., Kasimoglu, M., Yilmaz, S. and Sahiner, N. (2011), Hydrogel-Biochar composites for effective organic contaminant removal from aqueous media. *Desalination*, **280** (1-3), 319-325.

Full Text: [2011\Desalination280, 319.pdf](2011/Desalination280,%20319.pdf)

Abstract: In this study, p(acrylamide)-chicken biochar (p(AAm)-CB), p(acrylamide)-wood biochar (p(AAm)-WB), and p(acrylamide)-tire biochar (p(AAm)-TB) hydrogel composites were prepared using acrylamide (AAm) as monomer with the corresponding biochars, with N,N’-methylenebisacrylamide (MBA) as crosslinker and ammonium persulfate (APS) as initiator. P(AAm)-CB, p(AAm)-WB, and p(AAm)-TB were used as adsorbents to remove phenol from aqueous environments. The synthesized p(AAm)-CB, p(AAm)-WB, p(AAm)-TB and p(AAm) hydrogel composites had swelling values of 1112, 1045, 847, and 623%, respectively in distilled water. The prepared hydrogel biochar material compositions were examined using an elemental analyzer. Absorption of phenol into p(AAm)-WB was studied at different pHs to determine the optimum pH for maximum removal of phenol. The ionic strength of the medium was varied between 0.01 and 1 mol L-1 to determine the effect of salt (NaCl) on the absorption characteristics and it was found that the absorption of phenol increased with a decrease in the amount of salt. Langmuir and Freundlich isotherms were applied to describe the absorption characteristics and the Langmuir isotherm describes the absorption phenomena in this study much better than the Freundlich isotherm. Pseudo-first-order and pseudo-second-order kinetic studies were also applied to determine absorption characteristic. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbons, Adsorption, Biochar, Degradation, Dye, Hydrogel, Hydrogel-Composite, Isotherm, Langmuir, Mechanisms, Organic Contaminant Removal, Oxidation, pH, Phenol Absorption, Phenolic-Compounds, Reduction, Separation, Waste-Water

? Song, X.Y., Pan, Y.Q., Wu, Q.Y., Cheng, Z.H. and Ma, W. (2011), Phosphate removal from aqueous solutions by adsorption using ferric sludge. *Desalination*, **280** (1-3), 384-390.

Full Text: [2011\Desalination280, 384.pdf](2011/Desalination280,%20384.pdf)

Abstract: The binding efficiency of phosphate onto the ferric sludge was investigated by batch and column experiments to control the deterioration of water quality caused by eutrophication. Several adsorption isotherm models and kinetics models including pseudo-first order, pseudo-second order, Elovich mass transfer model and intra-particle diffusion model for the batch system and Thomas equation for the fixed column bed system were used to evaluate the equilibrium and kinetics data, respectively. Results showed that M-Langmuir model and pseudo-second order model were recommended to describe the adsorption equilibrium and kinetics characteristics. Moreover, the column experimental data fitted well with Thomas model with obtaining the maximum adsorption capacity of about 30 mg/g at pH 5.5, which was in conformity with a result presented in batch experiment. The insignificant effect of SO42- and Cl- on phosphate adsorption indicated that binding phosphate was through a kind of inner-sphere complexation. During the adsorption process, the pH changed significantly, indicating an anion/OH- exchange reaction. Further analysis of the adsorption kinetics indicated that the intra-particle diffusion was the rate limiting process. The above study implies that the ferric sludge has excellent potential in binding phosphate during wastewater treatment process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Aluminum, Biosorption, Column System, Equilibrium, Ferric Sludge, Fly-Ash, Iron, Isotherm, Kinetics, Model, pH, Phosphate, Phosphorus Removal, Red Mud, Simultaneous Sorption, Waste-Water, Wastewater Treatment

? Ghaedi, M., Hossainian, H., Montazerozohori, M., Shokrollahi, A., Shojaipour, F., Soylak, M. and Purkait, M.K. (2011), A novel acorn based adsorbent for the removal of brilliant green. *Desalination*, **281**, 226-233.

Full Text: [2011\Desalination281, 226.pdf](2011/Desalination281,%20226.pdf)

Abstract: Experiments were carried out to remove brilliant green dye by adsorption technique using a novel adsorbent (activated carbon prepared from acorn). The prepared adsorbent was characterized by BET surface area measurement, FTIR, SEM and elemental analysis. Various parameters such as initial dye concentration, adsorbent dose, initial pH and temperature were studied to observe their effects on the dye adsorption process. At optimum values of the above mentioned parameters, more than 90% removal efficiency was obtained within 30 min at adsorbent dose of 2 g/100 mL for initial dye concentration of 25 mg/L The percentage of dye removal remains almost constant within the pH range of around 6-10. The adsorption of dye was found to follow a pseudo-second-order rate equation. Intra particle diffusion model was studied in order to determine the rate limiting step of the adsorption process. Langmuir isotherm model was fitted the best for the adsorption system with an adsorption capacity of 2.11 mg/g of adsorbent. The present adsorbent may be considered as an alternative adsorbent for the better performance of the brilliant green dye removal from its aqueous medium. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acorn, Activated Carbon, Activated Carbon, Adsorbent, Adsorption, Adsorption, Aqueous-Solution, Bagasse-Fly-Ash, Bet, Brilliant Green, Dye Removal, Dyes, Equilibrium, FTIR, Isotherm, Kinetic And Thermodynamic, Langmuir, Methyl-Violet, Multiwalled Carbon Nanotubes, pH, Surfaces

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Full Text: [2011\Desalination281, 278.pdf](2011/Desalination281,%20278.pdf)

Abstract: The aim of this study is to develop a polyethylenimine (PEI) grafted magnetic porous adsorbent for highly effective adsorption of heavy metals. The process of grafting PEI was confirmed by Fourier transform infrared (FTIR) analysis. Batch tests were carried out to investigate the adsorption performance. Adsorption of Cu2+, Zn2+ and Cd2+ was dependent on pH and increasing the pH was favorable to metal ions removal. The adsorption equilibrium was reached within 10 min and well described by pseudo-second-order model. The sorption isotherms of the adsorbent for these metals fitted well with Langmuir model, with maximum adsorption capacities of 157.8, 138.8 and 105.2 mg/g for Cu2+, Zn2+ and Cd2+, respectively. Competitive adsorption among the three metal ions showed a preferential adsorption of Cu2+ > Zn2+ >Cd2+. The magnetic adsorbent exhibited excellent acid-alkali stability. In addition, the exhausted adsorbent can be regenerated by 0.02 mol/L EDTA solution without significant adsorption capacity loss. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Aqueous-Solutions, Biosorption, Cr(VI), FTIR, Gel-Coat, Heavy Metals, Langmuir, Magnetic Adsorbent, Metals, Nanoparticles, Pei, pH, Removal, Silica, Sorption, Waste-Water

? Yazdanbakhsh, M., Tavakkoli, H. and Hosseini, S.M. (2011), Characterization and evaluation catalytic efficiency of La0.5Ca0.5NiO3 nanopowders in removal of reactive blue 5 from aqueous solution. *Desalination*, **281**, 388-395.

Full Text: [2011\Desalination281, 388.pdf](2011/Desalination281,%20388.pdf)

Abstract: In the present study, nanoparticles of perovskite-type La0.5Ca0.5NiO3 (3-Δ) (LCNO) were fabricated by sol-gel method in the presence of nitrate-metal-ethylene glycol (EG) polymerized complex. A series of analytical techniques were used to characterize the crystallinity, morphology, specific surface area and grain size of La0.5Ca0.5NiO3 powders. Thermal decomposition process of the complex precursor was examined by means of differential thermal analysis-thermal gravimetric analysis (DTA/fGA). X-ray diffraction (XRD) results showed that single perovskite phase has been completely formed after calcination at 750 C. In addition, transmission electron microscopy (TEM) images revealed that the average size of the particles is approximately 10-32 nm in diameter. The surface morphology and composition of these nanopowders were also investigated using scanning tunneling microscopy (STM). scanning electron microscopy (SEM) and energy dispersive X-ray spectrometer (EDX). LCNO nanoparticles showed the excellent adsorption efficiency towards reactive blue 5 (RB5) as a reactive dye in aqueous solution. The adsorption studies were carried out at different pH values, dye concentrations, various adsorbent dosages and contact time in a batch experiments. The dye removal efficiency was found to be decreased with increasing in initial pH of dye solution, and LCNO exhibited good dye removal efficiency at acidic pH specially pH 2. Experimental results indicated that the adsorption kinetic data follow a pseudo-second-order rate for tested dye. The isotherm evaluations revealed that the Langmuir model attained better fits to the experimental equilibrium data than the Freundlich model. Finally, the photocatalytic degradation of RB5 using LCNO under solar light and UV irradiation at pH 2 was also investigated. The results showed that the nanoparticles cannot act as pure photocatalyst and the degradation of RB5 dye follows only an adsorption process. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Activated Carbon, Adsorbent, Adsorption, Azo-Dye, Azo-Dye Removal, Combustion, Composite, Degradation, Dye Removal, Dye Waste-Water, Freundlich, Isotherm, Kinetic, Kinetic Studies, Langmuir, Microscopic Analyses, Nanopowder, Perovskite-Type Oxide, pH, Reactive Blue 5, Sludge, Sorption

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Full Text: [2011\Desalination281, 396.pdf](2011/Desalination281,%20396.pdf)

Abstract: Arsenic removal from drinking water by adsorption on natural and iron modified clinoptilolite was investigated. The structure of modified and unmodified clinoptilolite samples from the Gordes-Manisa deposit was studied using X-ray diffraction (XRD) and scanning electron microscopy (SEM). The elemental composition and specific surface areas of zeolitic samples were also determined. The pretreatment of clinoptilolite using NaCl and FeCl3 solutions (0.1 and 0.01 M) resulted in 9.2 (92%) and 8.4 (84%) mu g g-1 of arsenic uptake, whereas only 1.5 mu g g-1 of arsenic uptake could be detected in the untreated zeolite at equilibrium time. The time required to attain equilibrium for arsenic sorption on all types of clinoptilolite was 60 min. The saturation time was independent of concentration of the initial arsenic solution. The pseudo-second-order rate equation described better the kinetics of arsenic sorption with good correlation coefficients than pseudo-first-order equation. At lower initial arsenate concentration, arsenate exhibited greater removal rates and best removed when the clinoptilolite modified by 0.1 M FeCl3 was used for adsorbent. This study showed that the amount of arsenic adsorbed on the adsorbents not only depends on the iron concentration in the clinoptilolite, but also depends on the initial arsenate concentrations. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorption Kinetics, Adsorptive Removal, Aqueous-Solutions, Arsenic, Arsenic Removal, As(V), Characterization of Adsorbent, Clinoptilolite, Clinoptilolite-Rich Tuffs, Coagulation, Contaminated Water, Groundwaters, Iron, Kinetics, Removal, Sorption, Turkey

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Full Text: [2011\Desalination282, 63.pdf](2011/Desalination282,%2063.pdf)

Abstract: In the present work, removal of strontium (up to 100 mg/L) from synthetic wastewater by electrocoagulation has been studied. Stainless steel and aluminum electrodes have been used and removal efficiencies have been compared with respect to electrocoagulation time, current density, amount of electrolyte added, solution pH, distance between electrodes, temperature and initial concentration of strontium. Preliminary operating cost estimation has been found out for both electrode materials. The strontium removal data has been used to find adsorption kinetics using pseudo-first-order and pseudo-second-order adsorption kinetics models. Results show that the optimum operating variables values are 50 min of process time, 8 mA/cm2 current density and solution pH 5 for which around 93% and 77% removal efficiency was achieved with using stainless steel and aluminum electrodes, respectively. Pseudo-second-order kinetic model fitted the data better than the pseudo-first-order model. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorption, Adsorption Kinetics, Aluminum, Aluminum Electrode, Aqueous-Solutions, Concentration, Electrocoagulation, Iron, Kinetic, Kinetics, pH, Removal, Stainless Steel Electrode, Strontium, Temperature, Wastewater, Water

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Full Text: [2009\Des Wat Tre1, 150.pdf](2009/Des%20Wat%20Tre1,%20150.pdf)

Abstract: The low molecular weight cut-off ultrafiltration process has become acceptable for drinking water treatment; however, irreversible fouling curtails the economic viability of such process. The objective of this study was to evaluate the effectiveness of an Ultrafiltration membrane on natural organic matter rejection and the components of natural water that contribute to fouling. Membranes with different molecular weight cut-off were employed. Experimental solutions consist of natural organic matter isolated from natural water or humic substances. The experimental solutions were prefiltered and diluted to prevent cake formation on membrane and change the fouling mode to pore blockage. The aggregation rejection caused irreversible fouling of the 100 kDa membrane, presumably a result of pore size reduction due to internal deposition aggregates. The solution showed differences in rejection, flux decline and membrane resistance.

Keywords: Acid, Adsorption, Aquatic Humic Substances, Cellulose, Cellulose Acetate, Change, Copolymers, Drinking Water, Drinking Water Treatment, Economic, Effectiveness, Filtration, Flux, Fouling, Membrane, Membranes, Microfiltration, Nanofiltration Membranes, Natural Organic Matter, Nom, Reduction, Rejection, Removal, Solutions, Surface, Treatment, UF Fouling, Ultrafiltration, Ultrafiltration Membrane, Water, Water Treatment

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Full Text: [2009\Des Wat Tre1, 186.pdf](2009/Des%20Wat%20Tre1,%20186.pdf)

Abstract: A polyethersulfone ultrafiltration membrane was functionalized by a cationic polyelectrolyte, the branched polyethyleneimine (BPEI). Several characterization techniques were carried Out to investigate the membrane modification. Atomic force microscopy and the tangential streaming potential measurement were used to characterize the outer surface of the membrane. Both techniques indicated that the surface was really modified. Electrokinetic measurements showed a charge reversal of the outer surface of the membrane when the cationic polyelectrolyte adsorbs onto the membrane. This charge reversal (from negative values for the unmodified membrane to positive values for the modified membrane) was also observed with membrane potential measurements. With the help of salt diffusion measurements, it was concluded that the charge reversal observed in membrane potential experiments resulted from the adsorption of BPEI onto the pore walls of the membrane (and not only on the outer surface of the membrane as could be concluded from single tangential electrokinetic measurements).

Keywords: Adsorption, Characterization, Composite Membranes, Conductance, Dehydration, Diffusion, Electrokinetic, Electrokinetic Characterization, Functionalized Membrane, Measurement, Membrane, Membrane Potential, Pervaporation, Polyelectrolyte, Polyelectrolyte, Polyethersulfone, Polymeric Membranes, Polysulfone Membranes, Positive, Sorption, Streaming Potential, Streaming Potential Measurements, Surface-Properties, Techniques, Ultrafiltration

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Full Text: [2009\Des Wat Tre1, 312.pdf](2009/Des%20Wat%20Tre1,%20312.pdf)

Abstract: This paper presents photocatalytic decolorization, computational fluid dynamics (CFD) modeling of decolorization and mineralization of textile dyes, Astrason Blue FGGL (AB) and Solophenyl Yellow FFL (SF), by photocatalysis using immobilized titania nanoparticle. UV-Vis spectrophotometry, Ion chromatography (IC) and total organic carbon (TOC) analyses were employed to obtain the details of the photocatalytic decolorization and mineralization of AB and SF. The CFD model was used to solve the mathematical equation describing decolorization process numerically taking into account finite volume descretization scheme. The CFD model predictions were compared to those results obtained from experimental tests for the decolorization of dyes by photocatalysis and close agreement was achieved. Ninety-five percent total organic carbon of both dyes can be eliminated after 240 min of irradiation time.

Keywords: Adsorption, Aqueous-Solution, Azo-Dye, Carbon, Cfd Modeling, Chromatography, Decolorization, Decolorization, Degradation, Dyes, Hydrogen-Peroxide, Immobilized TiO2, Ion Chromatography, Methylene-Blue, Mineralization, Model, Modeling, Nanoparticle, Nanoparticles, Operational Parameters, Oxidation, Photocatalysis, Photocatalytic Degradation, Predictions, Reactive Red-198, Spectrophotometry, Textile Dyes, Textile Wastewater, Titania, Titania Nanoparticle, TOC, Wastewater

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Full Text: [2009\Des Wat Tre2, 89.pdf](2009/Des%20Wat%20Tre2,%2089.pdf)

Abstract: NOM is known as a precursor to produce disinfection by-products such as THMs and HAAs in drinking water treatment. In this study, NOM removal and THMs reduction were investigated by comparing the conventional coagulation with enhanced coagulation using jar-test. Additionally coagulation efficiency was studied on activated carbon adsorption using adsorption isotherms for natural waters. The experimental data were simulated with IAST to investigate adsorbability of the NOM as multi-components isotherms. The results showed that enhanced coagulation could reduce 10-30% more of DOC and 5-20% more of THMs, respectively, than those of conventional coagulation, Adsorption capacity on activated carbon revealed that the enhanced coagulation had the highest capacity, followed by the conventional coagulation and raw water. The order of adsorption capacity can be explained by increase of strong adsorbable fraction and decrease of initial DOC concentration in enhanced coagulation.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Adsorption Isotherms, Capacity, Carbon, Coagulation, Disinfection, Disinfection By-Products, DOC, Drinking Water, Drinking Water Treatment, Efficiency, Enhanced Coagulation, GAC, Isotherms, NOM, NOM Removal, Reduction, Removal, Treatment, Water, Water Treatment

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Full Text: [2009\Des Wat Tre2, 101.pdf](2009/Des%20Wat%20Tre2,%20101.pdf)

Abstract: The biosorption characteristics of N and P nutrients by Zygnema sterile and Lepocinclism textra biomasses were closely investigated using a lab scale high rate culture system. From operating this system, the following points were obtained: the calculated AGP was 4.58×10-3 mg/d; the maximum of DO generation was 5.8 mg DO/L during peak algal growth for 1403.97 Chl.-a μg/L; this system generated an average of 0.77 mg/L DO/d; the fundamental biosorption mechanism can be considered as the movement of (+) and (-) electric charge on the algal biomass surface, similar to one of ion exchange; with the biosorption and passage of (-) ions onto and through the cell wall, respectively, the protomotive force becomes predominant.

Keywords: Biomass, Biosorption, Biosorption Characteristics of Nutrients, Carrageenan, Characteristics, Culture, Growth, Ion Exchange, Mechanism, Nutrients, Protomotive Force, Removal, Scale, System, Zygnema Sterile and Lepocinclism Textra Biomasses

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Full Text: [2009\Des Wat Tre2, 131.pdf](2009/Des%20Wat%20Tre2,%20131.pdf)

Abstract: Using electrocoagulation (EC) as a new method to treat boron containing effluent/wastes has been studied. With combined mechanisms of adsorption and precipitation, the EC is very effective to remove boron; 82% of boron from model waters ([B](0) = 250-500 mgL-1) can be removed at a current density of 62.1 Am-2(equivalent to 3.3 as molar ratio of Al:B). In the treatment of industrial effluents, the EC can effectively remove boron and arsenic simultaneously, the [As] was reduced from 15 to <0.1 mgl-1. A multistage EC configuration was even more effective and the boron removal percentage was >99.9%, i.e., after the fifth stage EC treatment, boron concentration can be decreased from 500 mgL-1 to less than 0.5 mgL-1. Chemical adsorption with freshly formed Al(OH)(3) flocs played a dominant role in the removal of boron from the wastes. Pre-pH adjustment was not necessary with the EC in the treating of low pH wastes, whilst all other technologies need to raise the Solution pH to neutral status.

Keywords: Adjustment, Adsorption, Arsenic, Boron Removal, Desalination, Electrocoagulation, Electrocoagulation (EC), Flotation, Mechanisms, Model, pH, Precipitation, Removal, Resin, Reverse-Osmosis, Solution pH, Treatment, Wastewater Treatment, Water

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Full Text: [2009\Des Wat Tre2, 139.pdf](2009/Des%20Wat%20Tre2,%20139.pdf)

Abstract: The removal of acid red 183 and acid green 25 onto walnut shells (Juglans regia) (WS) from aqueous solutions was investigated by using parameters such as contact time, temperature, pH, adsorbent doses and initial dye concentration. Adsorption equilibrium was reached within 30 min. The adsorption isotherms were described by means of the Langmuir and Freundlich isotherms. It was found that the Langmuir isotherm appears to fit the isotherm data better than the Freundlich isotherm. The maximum adsorption capacities for acid red 183 and acid green 25 on WS at 308,313, and 318 K were found to be 45,37, and 37; 21,14, and 7 mg g-1, respectively. The data obtained from adsorption isotherms at different temperatures were used to calculate some thermodynamic quantities Such as free energy of adsorption (ΔG°), enthalpy (ΔH°), and entropy (ΔS°). That ΔG° is negative, indicating that the nature of adsorption process for dyes is spontaneous. The positive value of ΔH° indicates that the adsorption of dyes onto WS is an endothermic process. The positive value of ΔS° reflects the affinity of the adsorbent for dyes. The kinetics and the factors controlling the adsorption process were also studied. The adsorption process followed a second-order model. WS, 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 Dyes, Adsorbent, Adsorption, Adsorption, Adsorption Isotherms, Adsorption of Dyes, Aqueous, Aqueous Solutions, Aqueous-Solutions, Basic-Dyes, Blue, Carbon, Dye, Dye Removal, Dyes, Endothermic, Entropy, Equilibrium, Freundlich, Freundlich Isotherm, Freundlich Isotherms, Isotherm, Isotherms, Kinetics, Langmuir, Langmuir and Freundlich Isotherms, Langmuir Isotherm, Model, pH, Positive, Reactive Dye, Removal, Sawdust, Second Order, Sludge, Solutions, Temperature, Thermodynamic, Treatment, Walnut Shells, Waste, Wastewater, Wastewater Treatment

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Full Text: [2009\Des Wat Tre2, 156.pdf](2009/Des%20Wat%20Tre2,%20156.pdf)

Abstract: The weakly and strongly basic anion-exchangers (Amberlite IRA-67, Amberlite IRA-958, Amberlite IRA-402) of acrylic or styrene-divinylbenzene matrices have been applied for Brilliant Yellow (BY) removal from the aqueous solutions. The total ion exchange capacities (9.1×10-4 mol/g, 6.12×10-4 mol/g and 4.38×10-5 mol/g for Amberlite IRA-958, Amberlite IRA-67, Amberlite IRA-402, respectively) as well as recovery factors of Brilliant Yellow were determined by the batch method. The influence of phase contact time, pH and temperature was studied. The anion-exchangers modified by means of Brilliant Yellow were also applied in order to remove Cu(II), Ni(II) or Co(II) ions from chloride solutions. As follows from the results, the anion exchangers of acrylicdivinylbenzene matrix can be widely recommended for BY removal from waters and wastewaters originating from textile industry because of their high selectivity.

Keywords: Anion Exchangers, Aqueous, Aqueous Solutions, Azo Dyes, Azo Dyes, Brilliant Yellow, Co(II) Ions, Cu(II), Ion Exchange, Ni(II), pH, Recovery, Removal, Silica-Gel, Solutions, Sorbent, Sorption, Temperature, Wastewaters

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Full Text: [2009\Des Wat Tre2, 185.pdf](2009/Des%20Wat%20Tre2,%20185.pdf)

Abstract: Mannitol doped and un-doped hybrid gels derived from bis(trimethoxysilylpropyl)amine (TSPA), or the mixture of TSPA with tetraethoxysilane (TEOS), or the mixture of 3-aminopropyltriethoxysilane (APTES) with TEOS were prepared. Textual properties and point of zero charges were determined to characterize the gels. The adsorption of boron from its water Solutions by the acidified and un-acidified gels in solutions at three different initial pH values were compared comprehensively. In general the gels derived from APTES and TEOS have the highest adsorption amount among all the gels. The gels doped with mannitol and the gels without doping show similar adsorption amount, that is, the addition of mannitol does not promote the adsorption. After acidification the adsorption amount of the gels increases. In general, the adsorption decreases with the increase in solution pH. It was found that boron is adsorbed in both H3BO3 and B(OH)4- forms through the interactions of hydrogen bonding, electrostatic and hydrophobic attractions. The information gained in this study is helpful for the understanding of the adsorption mechanisms, designing and preparing some low cost and easily available adsorbents for boron.

Keywords: Adsorption, Adsorption Mechanism, Aqueous-Solution, Boric Acid, Boron Removal, Dye Adsorption, Electrostatic Interaction, Fly-Ash, Hybrid Gel, Hydrogen, Hydrogen Bonding, Hydrophobic Interaction, Hydrotalcite-Like, Ion-Exchange, Iron, Mechanism, Mechanisms, Oxides, pH, Solutions, Water

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Full Text: [2009\Des Wat Tre2, 203.pdf](2009/Des%20Wat%20Tre2,%20203.pdf)

Abstract: Although coagulation has historically been used for turbidity removal, drinking water regulations have emerged in recent years expanding the use of this process beyond its traditional role to include disinfection by-products (DBP) precursors removal. Effective removal of DBP precursors is the one of the major challenges in modern drinking water treatment. DBP precursors are present in all surface water supplies existing as natural organic matter (NOM), and this type of precursors can be characterised by the following measurements of dissolved organic carbon (DOC), ultraviolet absorbance at 254 nm (UV254), specific ultraviolet absorbance (SUVA), and disinfection by-products formation potential (DBPFP). The effort to remove DBP precursors results in reduction of DBP formation in potable water. However, scientists discovered that chlorination of organic matter in raw water resulted in formation of DBPs. Because of concerns over the health effects of these organic by-products, several industrial countries have established limits for DBP in drinking water. The most known chlorination by-products are trihalomethanes (THM) and haloacetic acids (HAA). The US Environmental Protection Agency (USEPA) regulated THM and HAA in drinking water at the limit of 80 and 60 μg L-1, respectively, while recently, the European Union countries regulated THM in their water at the limit of 100 μg L-1. The USEPA has identified enhanced coagulation (EnC) as a best available technology (BAT) for reducing DBP precursors in conventional water treatment plants. Their removal by Eric depends on a variety of factors, including but not limited to, pH, alkalinity, coagulant type and dosage, and the type and concentration of NOM. Finally, electrocoagulation (EC) presents a robust novel and innovative alternative in which a sacrificial metal anode doses water electrochemically. This has the major advantage of providing active cations required for coagulation, without increasing the salinity of the water. EC is a complex process with a multitude of mechanisms operating synergistically to remove pollutants from the water. EC has the potential to remove efficiently DBP precursors which are essentially negative dissolved species by cationic charge neutralisation/electrical field oxidation/metal hydroxides adsorption. This paper tries briefly to describe NOM removal by coagulation, EnC and EC and shows that EC seems a priori to be the next future process step from coagulation passage via Eric process. However, the application of Eric to maximise removal of organics may not necessarily result in attainment of stringent levels of THMs in drinking water where chlorine is used as disinfectant. This is due to the concentration of residual DOM that is recalcitrant to removal by coagulation. This problem does not occur when the EC process is used, since disinfection is assured by EC itself. Consequently, more studies on application of EC as a substitute of chemical coagulation/disinfection at an industrial level must be done with NOM characterisation to optimise this process.

Keywords: Adsorption, Aluminum Salts, Carbon, Characterisation, Chlorine, Coagulation, Complex, Cryptosporidium, Disinfection, Disinfection By-Products, DOC, Drinking Water, Drinking Water Treatment, Drinking-Water Treatment, Electrocoagulation, Enhanced Coagulation, European Union, Filtration, Health, Humic Acids, Mechanisms, Metal, Natural Organic Matter, NOM, NOM Removal, Particles, pH, Precursors, Reduction, Removal, Species, Surface Water, Surface-Water, Technology, THM Precursors, Treatment, Trihalomethanes, US, Water, Water Treatment

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Full Text: [2009\Des Wat Tre2, 231.pdf](2009/Des%20Wat%20Tre2,%20231.pdf)

Abstract: Batch sorption experiments were carried out to remove methylene blue from its aqueous solutions using zeolite synthesized from fly ash as an adsorbent. Nearly 10 min of contact time are found to be sufficient for the adsorption of dye to reach equilibrium. Equilibrium data have been analyzed using Langmuir and Freundlich isotherms and the results were found to be well represented by the Freundlich isotherm equation. Adsorption data were fitted to both Lagergren first-order and pseudo-second-order kinetic models and the data were found to follow pseudo-second-order kinetics. Thermodynamic calculations Suggest that the adsorption of Methylene blue on zeolite synthesized from fly ash is spontaneous and exothermic reaction.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Kinetics, Aqueous, Aqueous Solutions, Aqueous-Solution, Basic Dye, Coal Ash, Dye, Dye Adsorption, Equilibrium, Equilibrium Data, First Order, Fly Ash, Freundlich, Freundlich Isotherm, Freundlich Isotherms, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir and Freundlich Isotherms, Mechanism, Methylene Blue, Models, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, Solutions, Sorption, Sphagnum Moss Peat, Thermodynamic, Thermodynamics, Waste-Water, Zeolite

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Full Text: [2009\Des Wat Tre3, 1.pdf](2009/Des%20Wat%20Tre3,%201.pdf)

Abstract: The potential use of mansonia wood sawdust as low-cost adsorbent for the sorptive removal of basic dye, methylene blue, from aqueous solution has been studied. The effect of sawdust particle size on the equilibrium methylene blue uptake was examined using batch sorption technique. Adsorption isotherm was determined using various particle sizes (150, 250, 350, 450 and 550 pm) of mansonia sawdust at 26°C and the experimental data obtained were modeled using the Langmuir, Freundlich, Tempkin and Dubinin-Radushkevich isotherms. The results revealed that the sawdust particle size has a strong influence on the percentage dye removal and on the amount of dye adsorbed per gram of sawdust from a 120 mg/dm3 dye solution. Increasing sawdust particle size from 150 to 550 Pm reduced the percentage dye uptake from 93.57% to 29.50% and amount of dye adsorbed per gram of sawdust from 28.07 to 8.85mg/g. The isotherm data were found to be well described by the Langumir, Tempkin and Dubinin-Radushkevich isotherm models. The monolayer capacity calculated from the Langmuir equation is given as 33.44 mg/g using sawdust of particle size 150 pm. The equilibrium binding constant K-1 calculated from the Tempkins was reduced with increasing sawdust particle size from 150 to 550 μm, while the mean free energy of sorption per mole of sorbate calculated from the Dubinin-Radushkevich isotherm was in the range 12.91 to 13.89 mol2kJ-2, suggesting that the sorption mechanism was by ion exchange. A mathematical relationship was also drawn between the equilibrium sorption capacity and the change in pH (ΔH°) at the end of the isotherm experiments with varying initial dye concentration, Supporting the fact that sorption of methylene blue dye on mansonia sawdust is by ion exchange. Desorption of sorbed dye molecules into solution was achieved at low pH conditions.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Aqueous, Aqueous-Solution, Bagasse Pith, Basic Dye, Batch Sorption, Biosorbent, Capacity, Desorption, Dye, Dye Removal, Dye Uptake, Equilibrium, Fixed-Bed, Freundlich, Indica Leaf Powder, Ion Exchange, Isotherm, Isotherms, Langmuir, Langmuir Equation, Low-Cost Adsorbents, Mansonia Sawdust, Mansonia Wood Sawdust, Mechanism, Methylene Blue, Methylene Blue Dye, Models, Monolayer Capacity, Particle Size, pH, Reactive Dyes, Removal, Sawdust, Sorption, Sorption Isotherm, Sorption Mechanism, Tree Fern, Waste-Water, Wood

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Full Text: [2009\Des Wat Tre3, 11.pdf](2009/Des%20Wat%20Tre3,%2011.pdf)

Abstract: The study reports on the development of hybrid composite membranes of sodium alginate loaded with hydrophilic alumina-containing Mobile Composition Matter-41 i.e., Al-MCM-41 in different compositions from 3 to 10 wt.% that are used for pervaporation (PV) dehydration of 1,4-dioxane and tetrahydrofuran (THF) from aqueous mixtures in compositions of 10-40 wt.% at 30°C. The PV performance of the hybrid composite membranes was much superior to that of plain NaAlg membrane in terms of selectivity and flux due to increased hydrophilicity of NaAlg membrane in the presence of Al-MCM-41 mesoporous zeolite particles that are also hydrophilic. Membranes crosslinked with glutaraldehyde were characterised by ion exchange capacity, Fourier Transform spectroscopy and X-ray diffraction. Morphology of the membranes was assessed by scanning electron microscopy. Sorption Studies have been performed to evaluate the extent of interaction and degree of swelling of the membranes with pure and mixed feed aqueous Mixtures of 1,4-dioxane and THF. It is observed that flux and selectivity increased systematically with increasing amount of Al-MCM-41 particles in the NaAlg matrix. In case of hybrid composite membrane containing 10 wt.% Al-MCM-41, selectivity for water was infinity, which was attributed to the combined effects of molecular adhesion between particle surfaces and NaAlg matrix as well as higher selectivity of the composite membrane when compared to plain NaAlg membrane.

Keywords: Acetic-Acid, Al-MCM-41, Alginate, Aqueous, Aqueous Mixtures, Blend Membranes, Capacity, Composite, Composite Membrane, Copolymeric Membranes, Dehydration, Development, Diffusion, Flux, Hybrid, Hybrid Membranes, Hydroxyethylcellulose, Interaction, Ion Exchange, Membrane, Membranes, Nanocomposite Membranes, Particles, Pervaporation, Poly(Vinyl Alcohol), Separation, Sodium, Sodium Alginate, Sorption, Spectroscopy, Swelling, Water, Water-Isopropanol Mixtures, X-Ray Diffraction, Zeolite

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Full Text: [2009\Des Wat Tre3, 43.pdf](2009/Des%20Wat%20Tre3,%2043.pdf)

Abstract: Removal of chromium(VI) from a dilute aqueous Solution was investigated using the sorption technique. Locally available wool from merino sheep was used as an sorbent for the removal of chromium(VI). The influence of operating parameters such as sorbent amount, contact time, pH and initial metal concentration in solution on the sorption capacity were studied in a batch system. Optimum conditions for sorption were determined as wool amount, 50 g L-1; pH 2; and contact time, 20 min. It was seen that when initial metal concentration in solution was increased, the uptake of Cr(VI) increased. Chxomium(VI) sorption for different types of wool was also examined. Kinetic data were processed using the intraparticle diffusion model. The results Suggest that the Cr(VI) uptake process seems to be controlled by external mass transfer at earlier stages and by intraparticle diffusion at later stages.

Keywords: Activated Carbon, Adsorption, Agricultural Waste, Aqueous, Aqueous Solutions, Batch System, Capacity, Chromium(VI), Cr(VI), Diffusion, Diffusion Model, Fly-Ash, Hexavalent Chromium, Industrial-Waste, Intraparticle Diffusion, Isotherm, Kinetic, Kinetics, Mass Transfer, Metal, Metal-Ions, Model, pH, Removal, Solutions, Sorption, System, Trivalent Chromium, Wool

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Full Text: [2009\Des Wat Tre3, 73.pdf](2009/Des%20Wat%20Tre3,%2073.pdf)

Abstract: Hydrogels of poly [(acrylic acid)-co-acrylamide], with N,N’-methylene bisacrylamide (MBA) crosslinker and different compositional ratios of kaolinite were prepared and investigated. The swelling characteristics of the hydrogels were investigated in distilled water as a function of clay content. The clay-hydrogel composite of 5.3%. clay percentage showed a higher swelling property in distilled water relative to clay-free hydrogel. The swelling ratio was found to be affected by the change in contact time, pH, salt solution and temperature. The adsorption properties of the hydrogels towards Mn(II), Cu(II) and Zn(II) in aqueous solutions were also studied at different conditions. The rate of adsorption followed the pseudo-second-order kinetics. Elution behavior of loaded hydrogel (P3) was also studied in EDTA solution.

Keywords: Acid) Hydrogels, Acrylamide, Acrylamide Polymers, Adsorption, Adsorption Properties, Aqueous, Aqueous Solutions, Change, Characteristics, Clay, Composite, Cu(II), Diffusive Gradients, Edta, Elution, Fertilizer, Hydrogels, Kaolinite, Kinetics, Metal, Metal Ions, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, Slow-Release, Soil, Solutions, Superabsorbent, Swelling, Temperature, Thin-Films Technique, Water, Water Sorption, Zn(II)

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Full Text: [2009\Des Wat Tre3, 210.pdf](2009/Des%20Wat%20Tre3,%20210.pdf)

Abstract: Biosorption has emerged as an alternative treatment for the removal of heavy metals. Although it is simple, effective and economic, it is nevertheless merely considered as a displacement of pollution. The loaded biomass constitutes a solid waste requiring regeneration, which is often achieved by a spontaneous desorption. In this study, we investigated the effect of an electric field applied through desorbent solution to enhance desorption flow. Moreover, desorbed metal ions may be recovered as metal deposit. The regeneration by the desorption-electrolysis process of Streptomyces rimosus biomass loaded with copper was carried out and the effects of the operating parameters, such as desorbent nature, pH and current intensity, were examined. Our results showed that adsorption agreed with the Langmuir isotherm. A maximum capacity of 25.32 mg.g-1 was reached. Among tested desorbent solutions, sulphuric acid was kept as more efficient. It allowed appreciable desorption rates, with an optimum pH of 1.5. An applied current intensity of 0.1 A led to an effectiveness of 86% at height of the released mass. We proved that the treatment by coupling desorption-electrolysis improved not only the desorption efficiency up to 99.77% but metal was also recovered as a pure electrochemical deposit.

Keywords: Adsorption, Algal Biomass, Aqueous, Aqueous Solutions, Bed Column, Biomass, Biosorption, Biosorption, Capacity, Copper, Desorption, Economic, Effectiveness, Electrochemical, Electrolysis, Enhancement, Fixed-Bed, Heavy Metals, Heavy-Metal Ions, Isotherm, Langmuir, Langmuir Isotherm, Metal, Metal Ions, Metals, pH, Pollution, Recovery, Regeneration, Removal, Saccharomyces-Cerevisiae, Sargassum Sp, Solutions, Treatment, Ulva-Fasciata, Waste, Waste-Water, Zinc

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Full Text: [2009\Des Wat Tre4, 89.pdf](2009/Des%20Wat%20Tre4,%2089.pdf)

Abstract: Tracer experiments are of concern to wastewater treatment engineers and researchers because of the importance of determining hydraulic regimes and retention times in wastewater treatment units. In this work, a pilot-scale maturation waste stabilisation pond (WSP) was spiked with Rhodamine WT, in order to determine how suspended organic matter would interfere with its performance as a tracer in a domestic wastewater treatment unit which had a high content of suspended algal biomass. A primary maturation pond was spiked in three separate runs with different levels of algae (high, medium and low), with a known amount of Rhodamine WT (20% v/v); the tracer was measured in the pond effluent in real time every 20 min for 3 theta (the theoretical retention time, theta = 17 d). Algal biomass was monitored weekly from influent, column and effluent water samples by chlorophyll-a determination. The results show that algal biomass has a strong influence on the behaviour of Rhodamine WT as a tracer and therefore the hydraulic characteristics calculated from tracer curves may be affected by tracer adsorption on suspended organic matter.

Keywords: Adsorption, Algal Biomass, Biomass, Characteristics, Effluent, Engineers, Hydraulic Characteristics, Influent, Maturation Ponds, Performance, Primary, Researchers, Retention, Tracer, Tracer Experiments, Treatment, Waste, Waste Stabilization Ponds, Wastewater, Wastewater Treatment, Water

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Full Text: [2009\Des Wat Tre4, 122.pdf](2009/Des%20Wat%20Tre4,%20122.pdf)

Abstract: In this work a tertiary horizontal-flow blast furnace slag (BFS) filter was tested for phosphorus removal under laboratory and field conditions. Laboratory experiments were conducted in a bench-scale BFS filter for phosphorus adsorption capacity at equilibrium conditions using P-spiked water. On-site, the performance of a pilot-scale BFS filter was monitored for phosphorus removal from the final effluent of a pilot-scale WSP system located in Esholt (Bradford, UK), which comprises a primary facultative pond and a secondary aerated rock filter (ARF) in series. Adsorption capacity (q) results showed that BFS has high affinity for inorganic P species and it can remove up to 30 g P/kg BFS; however, q values are strongly dependent on the initial P concentration. The pilot-scale BFS filter tested on-site performed better for longer (<2 mg P/L) than the laboratory-scale filter, even though despite the latter received the same hydraulic and P loadings (1.8 m(3)/m(3) d and 18g P/m(3) d, respectively). Both the laboratory and field results showed that BFS filters are an appropriate low-cost technology to upgrading small wastewater treatment systems for phosphorus removal.

Keywords: Adsorption, Adsorption Capacity, Blast Furnace Slag, Blast Furnace Slag Filter, Capacity, Constructed Wetland Systems, Domestic Wastewater Treatment, Effluent, Equilibrium, Phosphate, Phosphorus, Phosphorus Removal, Primary, Removal, Species, Stabilization, Substrate, System, Technology, Treatment, UK, Waste, Waste Stabilization Ponds, Wastewater, Wastewater Treatment, Water

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Full Text: [2009\Des Wat Tre4, 198.pdf](2009/Des%20Wat%20Tre4,%20198.pdf)

Abstract: In situations where gravity-fed septic tanks are not suitable - high water table, shallow depth of subsoil to bedrock or poor subsoil percolation or overlying particularly vulnerable groundwater resources - alternative approaches are required to improve the quality of the effluent before discharge to ground. Such options include the use of a sand filter or a raised mound soil percolation area, either as a secondary treatment unit or as a polishing filter. Investigations have been made into the use of recycled glass as an alternative media to sand in such filters and as a soil conditioner for mound systems. The phosphate removal capacity of six different indigenous types of sand and 3 grades of recycled glass were studied to determine their respective adsorption isotherms, finding the highest adsorption in calcareous sand but almost nothing for the recycled glass. Filters set up in parallel in the laboratory (one with a typical sand, the other with recycled glass) and dosed with wastewater found that the glass filter performed similarly (with the exception of phosphate) to the sand filter across a range of hydraulic loading rates (42-85 L/m(2).d) attaining removal efficiencies of 72-83% COD, 10-26% total nitrogen and 3.7-4 log removal of faecal coliforms. Both filters also performed better if the wastewater was applied in smaller-volume, more frequent doses. Finally, the addition of recycled glass into the matrix of a clay subsoil promoted a significant improvement in both the rate and uniformity of percolation, as measured both in the laboratory and out in the field demonstrating its potential for use in raised mound treatment systems.

Keywords: Adsorption, Adsorption Isotherms, Capacity, Clay, Cod, Constructed Reed Beds, Discharge, Effluent, Filtration, Glass, Groundwater, Isotherms, Nitrogen, Onsite Wastewater Treatment, Phosphate, Phosphate Removal, Phosphorus Removal, Raised Mound Systems, Recycled Glass, Removal, Renovation, Sand, Sand Filters, Sand-Filters, Septic-Tank Effluent, Soil, Soils, Treatment, Wastewater, Wastewater Treatment, Water, Water Table

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Full Text: [2009\Des Wat Tre4, 218.pdf](2009/Des%20Wat%20Tre4,%20218.pdf)

Abstract: Manganese-coated sand (MCS) and manganese-coated sericite (MCSe) were prepared at pH 4 and 9 (MCS4, MCS9, MCSe4 and MCSe9) and applied in the treatment of wastewater containing soluble Mn2+ in batch experiments under various pHs. The amount of Mn2+ adsorbed by manganese-coated solids increased as the solution pH increased from pH 4 to 11. In order to compare Mn2+ sorption onto manganese-coated solids in the presence of hypochlorite, 4 mg/L of NaClO was added into Mn2+ solution. It was observed that the presence of sodium hypochlorite dose significantly enhanced the uptake of Mn2+ from aqueous Solutions for the entire pH range studied i.e., pH 4.0 to 11.0. In adsorption isotherm experiment, the results were fitted reasonably well for the Freundlich equation. Mn2+ breakthrough time in the effluent from both MCS and MCSe columns in the presence of hypochlorite was greatly enhanced. Among these manganese-coated solids, MCSe4 showed the highest adsorption capacity. Therefore, MCSe4 was identified as a better adsorbent and filter material for the treatment of wastewaters containing Mn2+.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Aqueous, Aqueous-Solutions, Behavior, Breakthrough, Capacity, Characteristics, Column Experiment, Cu(II), Effluent, Freundlich, Iron, Isotherm, Manganese Removal, Manganese-Coated Solid, Naclo, Pb(II), pH, Removal, Sand, Sand, Sericite, Sodium, Sorption, Treatment, Wastewater, Wastewaters

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Full Text: [2009\Des Wat Tre4, 269.pdf](2009/Des%20Wat%20Tre4,%20269.pdf)

Abstract: A bone from a vertebrate has a hydroxyapatite (Ca-10(PO4)(6)(OH)(2)) structure which is well known as an excellent inorganic ion exchanger for various heavy metal ions in Solution. In order to evaluate the reusability of cow, pig and fish bones as removal material for heavy metals in wastewater, the ionic substitution properties and the removal capacities of these bones for the Cu ion were investigated. The results of X-ray diffraction and FT-IR spectra analyses showed that the surface of the three different bones was irregularly modified as increasing temperature and Cu ions were exchanged in the Ca part of bones. The removal capacity of the three different bones decreased with increasing temperature when the solution pHs were not controlled. Cu ion was removed almost 100% at over pH 7 while 20-60% was removed at pH 4. It is worth noting that bones calcined at 700°C have an ability of pH control of the solution where the reaction was from acidic to alkaline, although its mechanism is not yet clearly understood and thus further Study is necessary. The extraction experiment for three different bones which fully reacted with Cu ion shows no significantly re-extracted Cu ion even at pH 3.

Keywords: Adsorption, Adsorption, Animal Bone, Aqueous-Solutions, Capacity, Cobalt, Copper, Copper Removal, Cu, Cu(II), Fish, FT-IR, FTIR, Heavy Metal, Heavy Metals, Hydroxyapatite, Ionic Exchanger, Lead, Manganese, Mechanism, Metal, Metal Ions, Metals, Nickel, pH, Removal, Sorption, Temperature, Waste, Wastewater, X-Ray Diffraction

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Full Text: [2009\Des Wat Tre5, 1.pdf](2009/Des%20Wat%20Tre5,%201.pdf)

Abstract: Recirculating aquaculture systems (RAS) are essential for the reduction in fresh water usage as well as the discharge of nutrients along with aquaculture effluents. A RAS consisting of an anoxic reactor, a membrane bioreactor (MBR) and a UV-disinfection unit was used to process 10,000 L/d of aquaculture effluent providing high-quality treated water for recirculation to a Barramundi fish culture. The system maintained low levels of nitrate (<20 mg/L), nitrite (<3 mg/L) and ammonia (<0.6 mg/L) in the fish tank. Permeate from the membrane that was recirculated to the fish tank contained <21 mg/L of nitrate, <2 mg/L of nitrite and 0 mg/L of ammonia. However, the rate of fouling of the membrane in the MBR was around 1.47 kPa/d, and the membrane in the MBR required cleaning due to fouling after 16 days. Cleaning of the membrane was initiated when the TMP reached around 25 to 30 kPa. In order to reduce the rate of fouling, 500 mg of powdered activated carbon (PAC) per litre of MBR volume was introduced, which decreased the rate of fouling to 0.9 kPa/d. Cleaning of membrane was needed only after 31 days of operation while maintaining the treated effluent quality. Thus the frequency of cleaning could be halved due to the introduction of PAC into the MBR.

Keywords: Activated Carbon, Adsorption, Carbon, Culture, Denitrification, Discharge, Effluent, Filters, Fish, Fouling, Hybrid System, MBR, Membrane, Membrane Bioreactor, Membrane Bioreactor (MBR), Nitrate, Nitrite, Nutrients, Organics, PAC, Powdered Activated Carbon, Powdered Activated Carbon (PAC), Recirculating Aquaculture System (RAS), Reduction, Removal, Reuse, System, Transmembrane Pressure (TMP), Ultrafiltration, Water

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Full Text: [2009\Des Wat Tre5, 29.pdf](2009/Des%20Wat%20Tre5,%2029.pdf)

Abstract: Organic compounds, which are considered water pollutants, have the ability to react with chlorine or other oxidants leading to the formation of products which pose a significant threat to human health. Humic Substances play an important role in the formation of disinfection by-products. Therefore, the removal of organic compounds in the process of water treatment is of great importance. The application of ultrasound initiates a number of physicochemical processes in water which can be used in water treatment technologies, e.g. coagulation or adsorption. These methods, as well as the ion-exchange process, are applied in order to remove organic contaminants. With reference to the theoretical fundamentals of ultrasound, some sonochemical processes can result in a decrease in the content of color organic compounds in water. Increasing the intensity of ultrasonic field enhances the occurrence of sonochemical processes including the destruction Of high-molecular organic compounds or the oxidation reactions with radicals. The effect of the ultrasonic field is investigated as a method of water treatment by removal of color contaminants from water. Water samples were subjected to an ultrasonic field generated by the UP-400S ultrasound generator with a frequency of 24 kHz and useful power of 300 W. The samples were exposed to sonification for the time periods of 1 and 5 min; the range of the applied amplitude vibration was 18-90 mu m, and the ultrasonic field intensity was in the range 21-105 W/cm(2). The applied parameters allowed for the observation of changes in the content of organic compounds in water. The effect of the ultrasonic field was investigated for surface water. The water analysis included TOC, oxygen consumption and color. The efficiency of the investigated process (30-40%) was achieved for the highest value of the applied amplitude.

Keywords: Adsorption, Aqueous-Solutions, Chlorine, Coagulation, Consumption, Contaminants, Disinfection, Disinfection By-Products, Effluent, Health, Ion Exchange, Irradiation, Methods, Occurrence, Organic Compounds, Organic Contaminants, Oxygen Consumption, Play, Reduction, Removal, Sonochemical Processes, Surface Water, TOC, Treatment, Ultrasound, Ultrasounds, Water, Water Treatment

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Full Text: [2009\Des Wat Tre5, 106.pdf](2009/Des%20Wat%20Tre5,%20106.pdf)

Abstract: The adsorption of Pb(II) onto Algerian bentonite clay (Mostaganem region) was examined with respect to adsorbent dosage, solution pH, shaking time and initial concentration of metal. The results showed that the removal efficiency of Pb+2 by Algerian bentonite clay could reach 92% when the initial concentration of metal ions was 10 mg/L and shaking time 2 h. Two isotherm equations, the Freundlich and Langmuir models, were applied to describe equilibrium isotherms for the adsorption of Pb+2. The experimental results indicated that Algerian clay had significant potential for removing Pb+2 from wastewater using the adsorption method and a low-cost adsorbent.

Keywords: Adsorbent, Adsorption, Adsorption Isotherm, Aqueous, Bentonite, Clay, Equilibrium, Freundlich, Isotherm, Isotherms, Langmuir, Metal, Metal Ions, Models, Montmorillonite, Pb(II), Pb+2, Algerian Bentonite Clay, Pb2+, pH, Removal, Removal Efficiency, Wastewater

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Full Text: [2009\Des Wat Tre5, 153.pdf](2009/Des%20Wat%20Tre5,%20153.pdf)

Abstract: Removal of hazardous pollutants from wastewater is an essential step for safe recovery and reuse. The immediate objective of this paper is to discuss functional requirements and design considerations of a nanofiltration (NF)-based system for the treatment of pesticide industry effluents and contaminated Surface water. Techno-economic considerations for a 100 m3/d membrane filtration plant for the treatment of pesticide industry effluents and contaminated agricultural drainage water are presented. Metolachlor has been selected as the model for pesticide removal. The proposed system comprises membrane Ultrafiltration (UF), NF, and adsorption of pesticides using modified clays such as organoclays. This paper is concluded with design guidelines and indicators pertinent to the treatment of pesticide-containing wastewater using NF systems. The estimated capital cost of a 100 m3/d treatment facility amounts to $ 240,850. Further, the treatment cost is about $1.77/m3.

Keywords: Adsorption, Aqueous-Solution, Atrazine, Cost, Design, Drainage, Fiber NF Membrane, Indicators, Industrial Waste-Water, Membrane, Membrane Filtration, Metolachlor, Metolachlor, Model, Nanofiltration, Nanofiltration Membranes, Organoclay, Organoclays, Pesticide, Pesticides, Recovery, Rejection Properties, Removal, Reuse, Surface Water, System, Treatment, Ultrafiltration, Wastewater, Water

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Full Text: [2009\Des Wat Tre5, 267.pdf](2009/Des%20Wat%20Tre5,%20267.pdf)

Abstract: The purpose of this paper was to analyze molecular weight (MW) distribution in different drinking water treatment processes, and to find out the relationship between dissolved organic carbon (DOC) and disinfection by-products formation potential (DBPFP) in treated water. The results showed that in conventional water treatment, compared with similar methods, namely chlorination (Cl-2) and potassium permanganate (KMnO4), pre-ozonation can reduce DOC concentration for larger MW fractions (>30k, 10k-30k and 3k-10kDalton (Da)), while the smaller MW fraction portion increased. Coagulation, sedimentation and sand-filtration were effective to remove DOC in the larger MW fractions. Quantitative data were statistically explained. In combination with post-ozonation, biological activated carbon (BAC) can eliminate a large amount of DOC in the <1 kDa MW fraction. BAC with a 3-month service life had the optimal absorption and biodegradation effects. The treatment process was better at removing trihalomethane formation potential (THMFP) than haloacetic acid formation potential (HAAFP), though HAAFP concentration was reduced as well. In finished water, larger MW fraction had higher haloacetic acid (HAA) reactivity, and the part with lower than 1k and 1k-3k Da led to THMs formation.

Keywords: Absorption, Activated Carbon, Adsorption, Biodegradation, Carbon, Coagulation, Degradation, Disinfection, Disinfection By-Products, Doc, Drinking Water, Drinking Water Treatment, Haloacetic Acids, Landfill Leachate, Methods, Molecular Weight, Natural Organic-Matter, NOM, Organic Matter, Ozonation, Ozone, Precursors, Removal, Sedimentation, Thmfp, Treatment, Water, Water Treatment

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Full Text: [2009\Des Wat Tre6, 1.pdf](2009/Des%20Wat%20Tre6,%201.pdf)

Abstract: Resin adsorption technique with XAD-8 and XAD-4 was used to characterize the raw water from the Erlong reservoir in Jilin province, China. The NOM chemical composition sequences of the four organic fractions in the raw water, from high to low, are fulvic acid (FA) fraction, hydrophilic non-acid (HPINA) fraction, hydrophilic acid fraction(HPIA) fraction, and humic acid (HA) fraction. The experimental results show that FA is the main precursor of THMFP among the four organic fractions. However, HA or hydrophobic acid exhibits the highest chlorination activity in forming THMs. It is also found that the value of FI/DCC or SUVA and the specific THMFP have better positive correlation. Compared with former results, a part of these findings are different from some reports. It is implied that certain source water has a unique nature of NOM and DBPs.

Keywords: Adsorption, Characterization, China, Chlorination Activity, Composition, Correlation, Disinfection By-Products, Dissolved Organic-Matter, FA, Fraction, Fulvic Acid, Humic Acid, Natural Organic Matter, Nom, Positive, Resin, Resins, Thmfp, Water

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Full Text: [2009\Des Wat Tre6, 33.pdf](2009/Des%20Wat%20Tre6,%2033.pdf)

Abstract: This study aims at a better understanding of the effects of flocculants, and adsorbents on membrane bioreactor (MBR) mixed liquor. A total of 12 different additives (metal salts, chitosans, starches, synthetic polymers and PAC) were tested with regards to their impact on particle size distribution in activated sludge. Of further interest was the shear stability and dewaterability of sheared sludge. This was tested in a range of shear rates dominating in MBR. For most additives, a significant effect on the capillary suction time (CST) was observed. Most additives formed aggregates that were stable in the tested shear range (0-4000 s-1). Nevertheless, only the tested chitosans and polymers were able to significantly increase the Volume based particle size (up to 127%). In order to examine the long term effect of shearing on particle size three of the tested additives were surveyed in pilot plant experiments. Here the increase in particle size was only 17-18% for the tested polymers. In lab scale tests these polymers had caused an increase of approx. 50%.

Keywords: Activated Sludge, Adsorption, Adsorption, Chemicals, Dewaterability, Filterability, Floc, Flocculation, Flux, Flux Enhancer, Impact, MBR, Membrane, Membrane Bioreactor, Metal, PAC, Particle Size, Polymer, PSD, Scale, Shear, Sludge, Sludge Properties, Strength Waste-Water, Submerged Membrane Bioreactor

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Full Text: [2009\Des Wat Tre6, 74.pdf](2009/Des%20Wat%20Tre6,%2074.pdf)

Abstract: This study aimed to assess the performance of two carbonaceous actsorbents, i.e. self-dispersible carbon black (CB) particles (130 nm) and powdered activated carbon (PAC; 151 μm), in the hybrid treatment with microfiltration or ultrafiltration. It was revealed that, although the dissolved organic carbon (DOC) removal by CB was less than that by PAC, addition of CB prior to the membrane filtration significantly reduced membrane fouling, whereas PAC addition brought about a severe membrane fouling. The difference between these two actsorbents was explained by the dominance of aromatic organic matter in take water, selective adsorption of organics by the adsorbents, and a change of the cake structure of the adsorbents during the membrane filtration.

Keywords: Activated Carbon, Adsorption, Carbon, Carbon Black, Change, Doc, Fouling, Membrane, Membrane Filtration, Microfiltration, Molecular-Weight, Natural Organic Matter, PAC, Particles, Powdered Activated Carbon, Removal, Systems, Treatment, UF Membrane, Ultrafiltration, Water, Water Treatment

? Bach, A., Zelmanov, G. and Semiat, R. (2009), Wastewater mineralization using advanced oxidation process. *Desalination and Water Treatment*, **6** (1-3), 152-159.

Full Text: [2009\Des Wat Tre6, 152.pdf](2009/Des%20Wat%20Tre6,%20152.pdf)

Abstract: Water scarcity and environmental considerations are leading to the search for alternatives for industrial and urban wastewater reclamation. The objective of this research study was to examine the potential of recycling wastewater as an alternative or complementary technique for biological treatment. The degradation of organic matter from strained sewage and secondary treated sewage was studied using the advanced oxidation process (AOP) with hydrogen peroxide as an oxidant and iron oxide-based nanocatalysts. This process may be used when contaminants are resistant or toxic to conventional biological treatments. It also may be used as a complementary technique for polishing treated water. AOP, which involves the in situ generation of extremely strong oxidants such as hydroxyl radicals in aqueous solution, has recently appeared as a remarkable technique for accelerating the oxidation and degradation of a broad range of organic matter in wastewater. The final products of this process are carbon dioxide, water and inorganic salts. The oxidation of an organic compound by AOP is catalyzed by using transition metal oxides such as iron oxides. Another alternative for removing organic pollutants from aqueous streams is adsorption on activated carbon. The AOP process may be used on loaded active carbon or other adsorbents for cold regeneration, followed by successive repeated recycling of the adsorbent. It was shown that organic matter is efficiently destroyed by the Fenton-like reaction using FeOOH in the presence of hydrogen peroxide. The strong effect of nanocatalyst and hydrogen peroxide concentrations on reaction rate is demonstrated. The kinetic reaction was evaluated, and the reaction rate coefficient k was calculated. The optimal pH for destroying the organic matter was found to be around 2.7. Moreover, the results show high efficiency catalytic recovery of used activated carbon after treatment of filtered raw or secondary treated sewage, enabling the inexpensive reuse of the adsorbent.

Keywords: Activated Carbon, Adsorbent, Adsorption, Advanced Oxidation, AOP, Aqueous, Carbon, Carbon Dioxide, Contaminants, Degradation, Fenton-Like, Fenton-Like Process, Fentons Reagent, Goethite, Hydrogen, Hydrogen Peroxide, Kinetic, Metal, Mineralization, Organic Pollutants, pH, Recovery, Recycling, Regeneration, Research, Reuse, Sewage, TOC, Treatment, Wastewater, Water

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Full Text: [2009\Des Wat Tre6, 204.pdf](2009/Des%20Wat%20Tre6,%20204.pdf)

Abstract: Micellar-enhanced ultrafiltration (MEUF) represents a potentially attractive tool for the removal of different contaminants from wastewaters. In this study, MEUF has been carried out to investigate the retention of Direct Blue 71 (DB71 MW 965.94), an azo dye with a high worldwide consumption providing toxic effluents, from aqueous stream. The efficiency of MEUF on the removal of DB71 was studied as a function of dye and surfactant concentrations, type of surfactant, ionic strength and pH. The experiments showed that the highest dye rejection was about 98% for cationic surfactants due to the high electrostatic interaction between this surfactant and dye. The retention depended slightly on dye and surfactant concentration, ionic strength and pH. However, permeate flux decreases when surfactant and electrolyte concentrations increases which was mainly attributed to the concentration polarisation and osmotic pressure.

Keywords: Adsorption, Aqueous, Aqueous-Solution, Azo Dye, Consumption, Contaminants, Different Bentonites, Direct Blue71, Dye, Dye-Containing Effluents, Eosin Dye, Flux, Interaction, Membrane, Micelles, Nanofiltration, pH, Rejection, Removal, Retention, Separation, Surfactant, Surfactant, Ultrafiltration, Wastewater, Wastewaters

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Full Text: [2009\Des Wat Tre6, 252.pdf](2009/Des%20Wat%20Tre6,%20252.pdf)

Abstract: Oak sawdust (SD), which is the main waste from furniture industry in Egypt, has been used as an adsorbent without treatment or it was treated with 0.1 N sodium hydroxide (SD1) and 0.1 N sulphuric acid (SD2). Different adsorbents were characterized by SEM, TGA and FTIR to clarify the effect of treatment on the adsorption process. Oak sawdust and different treated Oak sawdust have been used for the removal of methylene blue dye from aqueous solutions. Batch adsorption experiments were performed as a function of pH, adsorbent dose, agitation speed, contact time and initial dye concentration. The optimum pH required for maximum adsorption was found to be 8. The experimental equilibrium adsorption data are tested for Langmuir, Freundlich and Temkin isotherms. Results indicate the following order to fit the isotherms: Langmuir > Temkin >>> Freundlich adsorption. Kinetics data were modeled using the pseudo-first and pseudo-second order, Elovich equations and intra-particle diffusion models. The results indicate that the second-order model best describes adsorption kinetic data with regard to the intra-particle diffusion rate. Thermodynamic parameters Delta H, Delta S and Delta G have been calculated for each type of adsorbents. Positive value of Delta H and negative value of Delta G show endothermic and spontaneous nature of adsorption respectively, also activation energy Ea has been calculated.

Keywords: Acid Dye, Activated Carbon, Activation, Activation Energy, Adsorbent, Adsorption, Agitation Speed, Aqueous, Aqueous Solutions, Basic Dye, Batch Adsorption, Cationic Dye, Coir Pith, Copper, Diffusion, Dye, Elovich, Endothermic, Equilibrium, Fixed-Bed, Freundlich, Ftir, Infrared-Spectroscopy, Intra Particle Diffusion, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherms, Kinetic, Kinetics, Langmuir, Methylene Blue, Model, Models, Palm-Fruit Bunch, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Sawdust, Second Order, SEM, Sodium, Solutions, Sorption, Thermodynamic, Thermodynamic Parameters, Treatment, Waste, Wood Sawdust

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Full Text: [2009\Des Wat Tre6, 269.pdf](2009/Des%20Wat%20Tre6,%20269.pdf)

Abstract: The present work has been devoted to study the kinetics and the mechanism of the phenol removal from water by surfactant-modified alumina (SMA). 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 was used for the removal of phenol from aquatic environment through the process, called adsolubilization. The SMA was found to be very efficient showing >90% phenol removal from a 50 mg/L phenol bearing solution with only 12 g/L of adsorbent dose. The kinetic study was conducted and the experimental data were analysed by different kinetic models viz., first order, second order, pseudo-first and pseudo-second order models. The details of rate-limiting step were studied. Isotherm study was conducted to find the maximum adsorption capacity and different isotherm models were analysed. The experiments were conducted with both phenol-spiked distilled water and synthetically prepared wastewater.

Keywords: Activated Carbon, Adsolubilization, Adsolubilization, Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Alumina, Anionic Surfactant, Aquatic Environment, Aqueous-Solution, Capacity, Degradation, Environment, First Order, Isotherm, Isotherm Study, Kinetic, Kinetic Models, Kinetics, Mechanism, Models, Phenol, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Limiting Step, Removal, Second Order, Silica, Sodium, Sodium Dodecyl Sulfate, Sulfate, Surfactant, Surfactant-Modified Alumina, Waste-Water, Wastewater, Water

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Full Text: [2009\Des Wat Tre6, 299.pdf](2009/Des%20Wat%20Tre6,%20299.pdf)

Abstract: A simple and cost-effective treatment procedure was proposed to remove nickel(II) from aqueous solution under the optimized conditions. It is based on the sorption of Ni2+ ions from aqueous solutions onto limestone (LS) fines, which is an inexpensive and widespread over the globe, followed by flotation with oleic acid (HOL) surfactant. The different parameters (namely: solution PH, sorbent, surfactant and nickel concentrations, shaking times, ionic strength, temperature and the presence of foreign ions) influencing the sorptive-flotation process were examined. Nearly, 99% of Ni2+ ions were removed from aqueous solutions at pH 7 after shaking for 5 min and at room temperature (similar to 25°C). The procedure was successfully applied to recover nickel(II) spiked to some natural water samples. Moreover, a sorption and flotation mechanism is suggested.

Keywords: Activated Carbons, Aqueous, Aqueous Solutions, Calcite, Flotation, Foreign Ions, Heavy-Metals, Hydroxyapatite, Limestone, Mechanism, Ni2+, Nickel, Oxidation, pH, Preconcentration, Removal, Retention, Solutions, Sorbent, Sorbents, Sorption, Surfactant, Temperature, Treatment, Water, Water-Adsorption

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Full Text: [2009\Des Wat Tre7, 152.pdf](2009/Des%20Wat%20Tre7,%20152.pdf)

Abstract: For As(V) removal aqueous system, 3 types slag which is a waste product from steel making process was used. Arsenic was mainly removed by Ca-As precipitation such as form Ca-3(AsO4)2. The removal efficiency of arsenic on slag was affected by iron oxide contents because arsenic was removed by adsorption on iron oxide. The experimental results were well fitted by pseudo-second-order and Langmuir isotherm model compared to other models. Arsenic was completely removed by Slag Y and Slag J within 12 h, 0.5 g and 0.7 g of Slag Y and Slag J are sufficient to remove arsenic of 20 mg/l arsenic. The removal efficiency increases with the decrease of initial pH and the decrease of initial arsenic concentration. The calcium that is a major component comes from dissolution of the lime (CaO). The calcium concentration increased at low initial pH because the solubility of the lime (CaO) increases at acidic condition. The equilibrium pH sharply increase after reaction because of creation of hydroxide ion.

Keywords: Activated Carbon, Adsorption, Adsorption Characteristics, Arsenic, Arsenic Removal, As(V), As(V) Removal, Calcium, Concentration, Dissolution, Efficiency, Equilibrium, Experimental, Hydroxide, Iron, Iron Oxide, Iron-Oxide, Isotherm, Isotherm Model, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Lime, Model, Models, Oxide, Oxides, pH, Precipitation, Pseudo Second Order, Pseudo-Second-Order, Removal, Removal Efficiency, Slag, Solubility, Steel Making Slag, Surfactant, Waste

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Full Text: [2009\Des Wat Tre7, 182.pdf](2009/Des%20Wat%20Tre7,%20182.pdf)

Abstract: The adsorption of phenol and methylene blue (MB) on modified activated carbons has been investigated. The activated carbon was prepared from date pits by physical activation (CO2 as activating agent). Oxidation in the liquid phase with nitric acid and thermal treatment under flowing nitrogen were carried out in order to produce samples with different surface chemical properties but with no major differences in their textural properties. The surface area and porosity were characterized by N-2 adsorption at 77 K and CO2 adsorption at 273 K. The changes in surface chemistry were studied by temperature programmed decomposition. Kinetic and equilibrium adsorption data of phenol and dye were carried out. Adsorption kinetic data were tested using pseudo-first-order, pseudo-second-order and intraparticle diffusion models. Equilibrium data were analyzed by Langmuir and Freundlich isotherm models. The maximum adsorption capacities calculated from the Langmuir isotherm model were 161.8 and 216.4 mg.g-1 for phenol and MB, respectively. The different uptakes obtained are discussed in relation to the chemical properties of the adsorbents. The results show that surface chemistry of the activated carbon plays a key role in phenol and dye adsorption. Finally, activated carbon from date pits with appropriate preparations can rich a high adsorption capacity.

Keywords: 77 K, Acid Treatment, Activated Carbon, Activated Carbons, Activation, Adsorbents, Adsorption, Adsorption Capacities, Adsorption Capacity, Adsorption Kinetic, Aqueous Solution, Capacity, Carbon, Changes, Chemical, Chemistry, CO2, Data, Date Pits, Decomposition, Diffusion, Dye, Dye Adsorption, Equilibrium, Freundlich, Freundlich Isotherm, Intraparticle Diffusion, Isotherm, Isotherm Model, Kinetic, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Liquid, Mb, Methylene Blue, Methylene-Blue, Model, Models, Modified, N2, N2, N2 Adsorption, Nitrogen, Oxidant Treatment, Phenol, Physical, Physical Activation, Porosity, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Role, Solution, Sorption, Surface, Surface Area, Surface Chemistry, Temperature, Thermal Treatment, Treatment

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Full Text: [2009\Des Wat Tre7, 242.pdf](2009/Des%20Wat%20Tre7,%20242.pdf)

Abstract: Several active carbons were prepared starting from Algerian date pits by chemical activation with the ZnCl2, by physical activation with the CO2, and by a method combined in the presence of ZnCl2/CO2. The active carbons obtained were followed by the evaluation of the yield and the physisorption of nitrogen at 77 K. Activated carbon particles were analyzed by scanning electron microscope (SEM). Indeed, it showed that mesoporous active carbon can be obtained at a lower cost by chemical impregnation in ZnCl2 with 800°C followed by activation with CO2. Thus, techniques combining the chemical method (ZnCl2) and the physical method (CO2) help to widen the pores allowing the conversion of the micropores into mesopores. Dye contamination in wastewater can lead to a variety of environmental problems. Colored water can affect plant life and thus an entire ecosystem can be destroyed by contamination of various dyes in water. The produced AC was tested against methylene blue and Congo red. This test was conducted to check the ability of the produced activated carbon. The mesoporous carbons showed high adsorption capacity of methylene blue and Congo red.

Keywords: Activated Carbon, Activated Carbons, Activation, Adsorption, Adsorption Capacity, Aqueous, BET Surface Area, Capacity, Carbon, CO2, Congo Red, Contamination, Dye, Dyes, Dyestuffs, Equilibrium, Evaluation, Lead, Methylene Blue, Nitrogen, Particles, Porosity, SEM, Techniques, Wastewater, Water, Zinc Chloride

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Full Text: [2009\Des Wat Tre7, 251.pdf](2009/Des%20Wat%20Tre7,%20251.pdf)

Abstract: Huge amount of palm oil mill effluent (POME) is generated from palm oil industry in Malaysia. POME is highly polluting wastewater which is organic in nature and contains oil and carotenes that need to be treated before discharge. Growing awareness to prevent pollution and increasing importance of carotenes has required POME to be transformed into valuable products. In this study, oil from POME was retrieved by solvent extraction and carotenes were isolated by adsorption chromatography. Synthetic adsorbent with silica-based material was used in the column chromatography. Different types of solvents used in the adsorption chromatography were evaluated on the recovery of palm carotene. Column temperature and oil loading were also studied. Isolation of carotenes from the extracted oil by column chromatography increased the carotene concentration in the oil. Carotene recovery varied from 47 to 92% depending on the chromatographic conditions. Carotene was successfully concentrated to about 70 times of the concentration in the extracted oil by adsorption chromatography process.

Keywords: Adsorbent, Adsorption, Adsorption Chromatography, Awareness, Carotene, Chemistry, Chromatographic, Chromatography, Column, Discharge, Effluent, Malaysia, Palm Oil Mill Effluent, Pollution, Recovery, Recovery, Solvent, Temperature, Wastewater

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Full Text: [2009\Des Wat Tre7, 257.pdf](2009/Des%20Wat%20Tre7,%20257.pdf)

Abstract: The activated carbons used in water technology are most frequently used to remove organic compounds. They can also be used in the adsorption of mineral pollution, among others for heavy metals. The adsorption capacities of activated carbons in relation to these pollutants are slight and their concentrations in water are also low. Heavy metal removal efficiency can be increased by modifying activated carbons. In the article the results of activated carbon modification with the usage of Joule heat are presented. The modification was carried out in the reactor with the height h = 25 cm and diameter d = 5.5 cm filled with activated carbon. At two sides of the reactor electrodes were placed which were joined with a direct current generator. The flow of the current through the deposit was accompanied by incensement of activated carbon temperature. The modification took place during the flow of carbon dioxide while heating and/or cooling down of this deposit. The effects of modification were evaluated on the basis of Cr(III) adsorption isotherms each time on three parts of activated carbon taken from different heights of the deposit. In the case of deposit modification as the result of heating up to 400°C and cooling down by means of flowing CO2 with the intensity of 40 dm(3)/h much higher adsorption capacities in relation to Cr(III) were obtained if carbon was taken from the bottom and the middle part of the deposit. The carbon from the high part of the deposit decreased its abilities of cation Cr(II) adsorption. Carrying out of the modification process of activated carbon in two cycles of heating up and cooling down is not advisable. The obtained Cr(III) adsorption results are higher than in the case of non-modified carbon, however, they are lower than on carbons modified in one cycle. It is also not advisable to pass carbon dioxide through the deposit during the heating up process. Increasing the speed of carbon dioxide flow during the cooling down of the deposit from 40 to 80 dm(3)/h has also been analyzed. The results obtained for Cr(III) adsorption prove that the change of carbon dioxide in the examined range did not have a great influence on the obtained sorbent.

Keywords: Activated Carbon, Activated Carbons, Adsorption, Adsorption Isotherms, Aqueous-Solution, Carbon, Carbon Dioxide, Change, Chromium(III), CO2, Cr(III), Heavy Metal, Heavy Metal Removal, Heavy Metals, Isotherms, Metal, Metals, Organic Compounds, Pollution, Removal, Removal Efficiency, Sorption, Technology, Temperature, Waste-Water, Water

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Full Text: [2009\Des Wat Tre8, 91.pdf](2009/Des%20Wat%20Tre8,%2091.pdf)

Abstract: This work consists to use distilled water as a solution in electrocoagulation (EC) tests using iron electrodes in order to bear witness to EC mechanisms and concerns EC of humic acids (HA) solution (10 mg L-1) in batch using aluminium electrodes with pH modification and magnetic agitation. The pH of the distilled water is adjusted to three representative values: 2 (acid), 7 (neutral) and 12 (alkaline). Based on the current intensity as a function of applied voltage variation and the pertinent literature, three mechanisms are proposed for acid, neutral and alkaline pH. For pH 2, Mechanism 1 explains Fe(OH)(2(s)) formation; for pH 7, Mechanism 2 concerns both the varieties Fe(OH)(2(s)) and Fe(OH)(3(s)) production; and for pH 12, Mechanism 3 is characterised by Fe(OH)3((s)) apparition. From these results, it can be seen that there is an extremely high dependence of iron species on pH in EC system. Finally, EC process using aluminium electrodes (better than iron ones) is proved highly efficient for HA removal (more than 70%) by charge neutralisation and adsorption (current density 16.6 A m(-2) during 30 min at pH 7).

Keywords: Adsorption, Aluminium, Coagulation, Decolorization, Dye Waste-Water, Electrocoagulation, Flotation, Humic Acids, Iron, Literature, Mechanism, Mechanisms, pH, Removal, Separation, Species, System, Water

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Full Text: [2009\Des Wat Tre8, 118.pdf](2009/Des%20Wat%20Tre8,%20118.pdf)

Abstract: The study evaluated the sorption of Cd(II) or Zn(II) ions from aqueous solution by a new biosorbent, dead tea fungus. The rate and extent of accumulation were affected by pH, initial metal ion concentration and contact time. The maximum removal of Cd(II) or Zn(II) were found to be 32 mg L-1 at pH 9 and 39 mg L-1 at pH 10, respectively. The equilibrium process was described well by the Langmuir isotherm model with maximum sorption capacities of 35 and 40 mg g-1 of Cd(II) and Zn(II) on tea fungus, respectively, which in agreement with the experimental data. The removal process was rapid and equilibrium was established in less than 30 min. Good correlation coefficients were obtained when the pseudo-second-order kinetic model of this process was assumed. Dead tea fungus was found to be an efficient biosorbent of metal ions from the effluent of electroplating industry.

Keywords: Accumulation, Aqueous Solution, Biomass, Biosorbent, Biosorption, Biosorption Isotherm, Cadmium, Cd(II), Concentration, Correlation, Data, Effluents, Electroplating Wastewater, Equilibrium, Experimental, Fungus, Heavy-Metal Removal, Ions, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetics, L1, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Metal, Metal Ion, Metal Ions, Model, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Rouxii, Solution, Sorption, Tea Fungus, Temperature, Waste, Zinc, Zinc(II), Zn(II), Zn(II) Ions

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Full Text: [2009\Des Wat Tre8, 124.pdf](2009/Des%20Wat%20Tre8,%20124.pdf)

Abstract: The adsorption of lead [Pb(II)] ions onto adsorbents prepared by alkali solid-state conversion of kaolin and natural zeolite mixture was investigated. The adsorption isotherms were obtained and the Langmuir parameters were calculated in order to make a comparison between the adsorption capacities of synthesized adsorbents and those of their constituents. The synthesized adsorbents exhibit much higher adsorption capacity than kaolin and zeolite. Therefore, the low-cost adsorbent based on kaolin and Jordanian zeolite has important features since it has an extraordinary adsorption capacity towards Pb(II) ions (157 mg Pb(II)/g at pH 6.0 and 0.1 M ionic strength). Furthermore, the results implied the advantage of using zeolite as filler in kaolin-based geopolymers and the advantage of using kaolin as a binder for zeolite in their use as industrial adsorbents in water purification. The adsorption capacity of the synthesized adsorbents, unexpectedly, increases with pH decrease and ionic strength increase. The XRD pattern of the synthesized adsorbent prepared from Jordanian kaolin (JK) and zeolite indicates that it is amorphous.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Isotherms, Alkali Solid-State Conversion, Aqueous, Capacity, Clay, Comparison, Copper, Fly-Ash, Heavy-Metals, Isotherms, Jordanian Zeolitic Tuff, Kaolin, Langmuir, Lead, Natural Zeolite, Pb(II), pH, Removal, Sorption, Water, XRD, Zeolite

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Full Text: [2009\Des Wat Tre8, 139.pdf](2009/Des%20Wat%20Tre8,%20139.pdf)

Abstract: A new adsorbent, ordered mesoporous Fe-modified ZrO2, was prepared and applied for the adsorption of arsenite [As(III)] and arsenate [As(V)] from water. The adsorbent showed higher efficiency for the removal of As(III) and As(V) than that of unmodified mesoporous ZrO2, especially of As(III) without pre-oxidation. The maximum uptake at pH 7.0 was 80 mg g-1 for As(III) and 45 mg g-1 for As(V). The behavior of arsenic adsorption onto Fe-modified ZrO2 was investigated by adsorption isotherms, adsorption kinetics, and the effect of pH on adsorption. The adsorption equilibrium of arsenite was rapid, with 90% adsorption within 1 h. Furthermore, the interactions of As(V) and As(III) with adsorbent were investigated using electrophoretic mobility (EM) measurements and Fourier transform infrared (FTIR) spectroscopy. The adsorption of As(V) and As(III) decreased the isoelectric point of Fe-modified ZrO2 from 6.00 to 3.00 and 4.51, respectively, suggesting the formation of negatively charged inner-sphere complexes for both arsenic species. The results of FTIR suggested that the -OH band on the surface was the adsorption sites. The more adsorption sites were formed on mesoporous ZrO2 modified with Fe, which possessed abundant surface hydroxyl groups, resulting higher efficiency for arsenic removal.

Keywords: Activated Alumina, Adsorbent, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Aqueous-Solution, Arsenate, Arsenate Adsorption, Arsenic, Arsenite, As(III), As(V), Equilibrium, Fe-Modified, Ferrihydrite, FTIR, Groups, Isotherms, Kinetics, Mechanism, Mechanism, Mesoporous Zirconia, Nanocrystalline Titanium-Dioxide, Oxide Adsorbent, pH, Removal, Species, Spectroscopy, Water, Zirconia

? Kwon, B., Shon, H.K. and Cho, J. (2009), Investigating the relationship between model organic compounds and ultrafiltration membrane fouling. *Desalination and Water Treatment*, **8** (1-3), 177-187.

Full Text: [2009\Des Wat Tre8, 177.pdf](2009/Des%20Wat%20Tre8,%20177.pdf)

Abstract: The aims of this study were to investigate the fouling mechanisms of model organic compounds (MOCs) On two ultrafiltration membranes [composite regenerated Cellulose (YM100) and polyethersulfone (PES)] and the relationship between fouling and membrane characteristics, flux decline, and the streaming potential (SP). Two alginic acids (polymer and dimmer, AA), abietic acid (AbA), colominic acid (CA), and N-acetylneuraminic acid (NA) were selected as MOCs to test their membrane fouling potential through flux decline and SP. The fouling caused by the two AAs, which contained many polysaccharides, was the highest among MOCs, but this fouling was external (solute deposition on the membrane surface) and reversible as polysaccharides did not strongly adsorb onto the YM100 and PES membranes. CA also caused external fouling of the two membranes; however, AbA caused internal (solute adsorption on the pores wall of membrane) and irreversible fouling of the PES membrane. NA, which contained amino sugars, exhibited very low fouling of both membranes. The hydrophilic YM100 membrane experienced less fouling than the hydrophobic PES membrane with all MOCs. The measurement of the SP using a modified dead-end filtration cell was employed to evaluate the flux decline due to MOCs.

Keywords: Adsorption, Cellulose, Characteristics, Charge, Colominic Acid, Drinking-Water, Flux, Fouling, Fouling Potential, Matter, Measurement, Mechanism, Mechanisms, Membrane, Membranes, Model, Nanofiltration Membranes, NOM, Organic Compounds, Organic Matter, Polymer, Polysaccharides, Solute, Streaming Potential, Streaming Potential Measurements, Surface-Water, UF Membranes, Ultrafiltration

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Full Text: [2009\Des Wat Tre8, 201.pdf](2009/Des%20Wat%20Tre8,%20201.pdf)

Abstract: In this work, eucalyptus bark, a forest waste, was evaluated for its ability to remove malachite green (MG) from aqueous solutions. Sorption kinetic experiments were Studied in a batch mode operation at various initial dye concentrations, sorbent dosages, and temperatures. The equilibrium sorption data of MG by eucalyptus bark were analyzed by Langmuir and Freundlich isotherm models. The results indicate that both the Langmuir and Freundlich equations provide good correlation of the experimental data, but the Langmuir expression fits the equilibrium data better. The Maximum sorption capacity of eucalyptus bark was found to be 59.88 mg g-1 at 20ºC. Pseudo-first-order, pseudo-second-order, and intraparticle diffusion models were used to analyze the kinetic data obtained at different concentrations. Among the kinetic models studied, the pseudo-second-order was the best applicable model to describe the sorption of MG by eucalyptus bark. The overall rate of dye uptake was found to be controlled by external mass transfer at the beginning of sorption, while intraparticle diffusion controlled the overall rate of sorption at a later stage. The results indicate the potential of eucalyptus bark as biosorbent for the removal of basic dye from aqueous solution.

Keywords: Activated Carbon, Adsorptive Removal, Aqueous Solution, Aqueous Solutions, Aqueous-Solution, Basic Dye, Batch, Batch Mode, Biosorbent, Capacity, Correlation, Data, Diffusion, Dye, Equilibrium, Eucalyptus Bark, Experimental, Experiments, Expression, Forest, Freundlich, Freundlich Isotherm, Heavy-Metal, Industry Waste, Intraparticle Diffusion, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Expression, Low Cost, Malachite Green, Mass Transfer, Mg, Mode, Model, Models, Operation, Potential, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Reactive Dyes Removal, Removal, Solution, Solutions, Sorbent, Sorption, Sorption Capacity, Sorption Isotherm, Sorption Kinetics, Uptake, Waste, Waste-Water, Wastewaters, Work

? Lin, J.X. and Wang, L. (2009), Adsorption of dyes using magnesium hydroxide-modified diatomite. *Desalination and Water Treatment*, **8** (1-3), 263-271.

Full Text: [2009\Des Wat Tre8, 263.pdf](2009/Des%20Wat%20Tre8,%20263.pdf)

Abstract: Diatomite and Mg(OH)(2)-modified diatomite (MMD) were employed as adsorbents for the removal of one cationic dye, Methylene Blue (MB), and two anionic dyes, Ramazol Golden Yellow (RGY) and Telon Blue (TB), from aqueous Solution. Physical characteristics of the adsorbents were investigated using scanning electron microscope (SEM), energy dispersive X-rays (EDX), pH value of isoelectric point of zeta potential (pH(IEP)) and Fourier transform infrared (FTIR) analyses. The Mg(OH)(2) content of MMD was found to be 13.45%, and three isoelectric points were observed around pH 2.0, 8.5 and 11.5 for MMD. The adsorption performance of dyes onto diatomite and MMD was studied using spectrophotometric analysis. It showed that the modification of diatomite enhanced removal of the anionic dyes from aqueous solution. The adsorption data were fitted to the Langmuir, Freundlich and Redlich-Peterson models. The results indicated that the Redlich-Peterson model was the best one in simulation of the adsorption isotherms, suggesting some heterogeneity in the Surface or pores of the adsorbents. The adsorption of dyes onto diatomite and MMD may be attributed to electrostatic interaction, hydrogen bonding interaction, n-pi interaction and Van Der Waals interaction.

Keywords: Adsorbents, Adsorption, Adsorption Isotherms, Anionic Dyes, Aqueous, Aqueous-Solution, Behavior, Cationic Dye, Cationic Dyes, Characteristics, Diatomite, Dye, Dyes, Earth, Freundlich, FTIR, Heterogeneity, Hydrogen, Interaction, Isotherms, Langmuir, Magnesium, Magnesium Hydroxide, Methylene Blue, Methylene-Blue, Model, Models, pH, Removal, SEM, Sepiolite, Simulation, Temperature, Textile Dye, Textile Dyes

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Full Text: [2009\Des Wat Tre9, 36.pdf](2009/Des%20Wat%20Tre9,%2036.pdf)

Abstract: In the Nanofiltration (NF) membrane systems utilised for river water treatment for drinking water production purposes, 15-25 % of the feed is rejected by the membrane as the concentrate. It contains natural and synthetic organic matter (COD ca. 30 mg/L) and its composition may vary with raw water quality, membrane pre-treatment and NF membrane cut-off. This study aims to achieve complete elimination of pesticides and the elimination of 60% of the natural organic matter (NOM) retained during nanofiltration step. The investigation included testing conventional water treatment techniques-adsorption, coagulation, ozonation-and the combination of ozonation and adsorption processes. Eight pesticides detected most commonly in French surface waters were selected as model micropollutants: atrazine, sulcotrione, bentazone, isoproturon, diuron, glyphosate, amitrole and acetochlore. Simultaneous combination of ozonation and powdered activated carbon (PAC) adsorption proved to be an efficient method for the elimination of the polar and ozone resistant pesticides at low carbon and ozone concentrations. This combination also achieved faster NOM removal than PAC adsorption only. It was observed that even with the use of high PAC concentrations, addition of low ozone dosages were necessary to degrade highly polar pesticides together with the NOM. No significant modification of the carbon activity and surface properties was observed at low ozone concentration levels, ca. 3 mg/L.

Keywords: Activated Carbon, Adsorption, Carbon, Coagulation, COD, Composition, Concentrate, Drinking Water, Elimination, Membrane, Micropollutants, Model, Nanofiltration, NOM, Organic Matter, Ozonation, Ozone, PAC, Pesticide, Pesticides, Powdered Activated Carbon, Removal, River, Treatment, Water, Water Quality, Water Treatment

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Full Text: [2009\Des Wat Tre9, 86.pdf](2009/Des%20Wat%20Tre9,%2086.pdf)

Abstract: The aim of the research is to show the bene fits of the use of submicron powdered activated carbon (SPAC) in combination with ceramic microfiltration. The SPAC is applied to the surface as a pre-coat layer. The goals are to improve the removal of NOM and organic micro-pollutants. The SPAC pre-coat layer is also used to reduce fouling of the microfiltration membrane (without the use of a coagulant). Additionally, virus removal might be increased by the SPAC-layer. The results are presented from laboratory scale experiments with flat sheets membranes and from pilot experiments with a ceramic membrane module. The laboratory scale experiments show good results for NOM-removal and atrazine removal. Although the empty bed contact time is very short (<1 s), actual breakthrough curves are observed for these two components. The small particle size is beneficial for the adsorption kinetics of the components. In laboratorys’ experiment, the SPAC also contributed to physical removal (straining) of biopolymers during the filtration of surface water. Because these biopolymers are removed before they can reach the membrane surface, we expect that the fouling of the ceramic membrane will decrease. However, we could not confirm this in pilot experiment because the SPAC layer did not evenly coated the membrane surface or the SPAC was already flocculated before being dosed to the membrane.

Keywords: Activated Carbon, Adsorption, Adsorption Kinetics, Breakthrough, Carbon, Ceramic Membranes, Fouling, Kinetics, Membrane, Membranes, Micro-Pollutants, Microfiltration, Micropollutants, Nom, Particle Size, Powdered Activated Carbon, Pre-Coat, Removal, Research, Scale, Surface Water, Water

? Delgado, L.F., Dorandeu, C., Marion, B., Gonzalez, C., Faucet-Marquis, V., Schetrite, S. and Albasi, C. (2009), Removal of a cytostatic drug by a membrane bioreactor. *Desalination and Water Treatment*, **9** (1-3), 112-118.

Full Text: [2009\Des Wat Tre9, 112.pdf](2009/Des%20Wat%20Tre9,%20112.pdf)

Abstract: The application of membrane bioreactor process is investigated in the aim of evaluating the potential for removal of cyclophosphamide (CP). Two laboratory-scale membrane bioreactors (MBR) were run in parallel, one with CP and its principal metabolites (MBR1-CPs), and one without (MBR2-control). Removal of CP in an MBR and its effects on the membrane performance, chemical oxygen demand (COD) and total nitrogen (TN) removal efficiency were studied. Removals of 80% were achieved for CP and the metabolite 4-ketocyclophosphamide under the operating conditions studied. Both adsorption and degradation affect the overall removal. The toxicity of CP and its metabolites does not alter the COD or TN removal efficiency of MBR. However, it induces a modification of the biological suspended solids and so a modification of the membrane fouling.

Keywords: Activated-Sludge, Adsorption, Cancerostatic Platinum Compounds, COD, Cyclophosphamide, Cyclophosphamide, Degradation, Environment, Fate, Fouling, Membrane, Membrane Bioreactor, Micropollutants, Micropollutants, Nitrogen, Polar Pollutants, Removal, Removal Efficiency, Surface Waters, Toxicity, Treatment Plants, Waste-Water Treatment, Wastewater

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Full Text: [2009\Des Wat Tre9, 149.pdf](2009/Des%20Wat%20Tre9,%20149.pdf)

Abstract: Arsenic occurs naturally in the ground and surface water and is not desired in the drinking water due to carcinogenic effect on human body. The common types of arsenic are arsenate (As V) and arsenite (As III). Although arsenate removal has been achieved by membranes, adsorption, ion exchange and coagulation, arsenite removal is difficult to decrease the concentration up to the standard level (below to 10 mu g/L). In this study, nanofiltration (NF) and adsorption techniques have been compared to remove arsenite from drinking water. In nanofiltration study, different NF membranes and arsenite feed concentrations have been Studied. Feed water was prepared synthetically and laboratory scale cross-flow mode filtration apparatus with a flat-sheet membrane cell was used for NF experiments. In the adsorption experiments with granular iron hydroxide (GIH), all studies were performed in the free water flow and at the normal pH of tap water. It was concluded that arsenite concentration was lowered to below 1.0 mu g/L with adsorption. These results showed that GIH adsorption can be used to remove arsenite concentration of 0.1 and 0.5 g/L from water supplies.

Keywords: Adsorbents, Adsorption, Arsenate, Arsenic, Arsenite, Arsenite Removal, Coagulation, Drinking Water, Granular Iron Hydroxide, Ion Exchange, Membrane, Membranes, Nanofiltration, Nanofiltration Membranes, pH, Removal, Scale, Surface Water, Techniques, Water

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Full Text: [2009\Des Wat Tre9, 165.pdf](2009/Des%20Wat%20Tre9,%20165.pdf)

Abstract: In this study, the potential of UV/TiO2 photocatalytic oxidation method to control of membrane fouling caused by natural organic matter (NOM) was investigated under various conditions in submerged MF membrane system. Effect of TiO2 concentration, UV irradiation in the absence of TiO2, TiO2 in the absence of UV irradiation and combination of UV/TiO2 photocatalytic oxidation were investigated. Additionally, intermittent and continuous UV application and initial NOM concentration on the pressure increase and rejections were also studied. The results of synthetic and raw water experiments were compared. It was found that TiO2 concentration is very important parameter by means of permeate pressure increase and removal efficiencies. UV irradiation in the absence of TiO2 or TiO2 in the absence of UV irradiation was not effective and combination of UV/TiO2 photocatalytic oxidation gave better results. Also, intermittent UV application was not as effective as UV/TiO2. The increase in NOM concentration also increased the pressure increase. Synthetic and raw water experiments were compared and raw water experiments gave higher pressure increase and lower removal efficiencies.

Keywords: Adsorption, Adsorption, Bisphenol-A, Degradation, Drinking Water, Drinking Water Treatment, Fouling, Hybrid, Membrane, Microfiltration, Natural Organic-Matter, Nom, Nom Removal, Photocatalytic Oxidation, Reactor, Removal, Separation, Submerged Membrane System, System, TiO2, Treatment, UV Irradiation, UV, TiO2 Photocatalytic Oxidation, Water, Water Treatment

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Full Text: [2009\Des Wat Tre9, 241.pdf](2009/Des%20Wat%20Tre9,%20241.pdf)

Abstract: Algae fouling can cause a transmembrane pressure (TMP) increase or flux decrease during ultrafiltration of surface waters. In this study, chemical preoxidation coupled with in-line coagulation was investigated as a pretreatment step for algae fouling control. The coupled strategy was able to control the flux decline. Also, the treated water quality could be improved. Chemical preoxidation by potassium permanganate composites (PPC) and chlorine (Cl-2) removed algae cells by both cell death and adsorption, which could also alleviate the load on the ultrafiltration unit. During the coupled treatment, the electrostatic forces between algae cells and the flocs weaken. The cells could be packed by in situ formed hydrous manganese dioxide and flocs. The flocs would be trapped on the cake layer and the algae fouling for ultrafitlration could be controlled.

Keywords: Adsorption, Algae, Chemical Preoxidation, Chlorine, Coagulation, Drinking-Water, Flux, Fouling, In-Line Coagulation, Membranes, Natural Organic-Matter, Removal, Treatment, Ultrafiltration, Water, Water Quality

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Full Text: [2009\Des Wat Tre9, 272.pdf](2009/Des%20Wat%20Tre9,%20272.pdf)

Abstract: Well characterised, hydrophobic, poly(vinylidene fluoride) and poly(sulfone) membranes, a physisorbed amphiphillic surfactant as an affinity linker with covalently attached bio-specific ligands to demonstrate heavy metal ion binding and re-use is reported. Central to this technology are the easy to manufacture membranes and a biocompatible Pluronic (TM) surfactant that serves multiple functions, where it acts not only as an affinity linker, preventing non-specific protein adsorption to the membrane surface but also non-covalently hydrophilises the membrane matrix. This work describes the fabrication and characterisation of non-porous, hydrophobic membranes for the attachment of a robust, bio-compatible ligand, in order to specifically chelate divalent cations (Cd2+, Ni2+, Zn2+, Cu2+) and subsequently, histidine tagged proteins. These affinity tags are frequently used by bioengineers and biochemists to produce recombinant enzymes, peptides, hormones and antibodies. Successful coupling of ligands to Pluronic was achieved followed by quantification of the ligand binding sites on the surface. This technology is scalable (due to the multi-variant membrane module design), able to resist non-specific protein adsorption and can be regenerated and re-used (up to five times) with a simple anionic surfactant solution.

Keywords: Adsorption, Affinity Membranes, Affinity-Chromatography, Cd2+, Characterisation, Chelating Ligand, Cu2+, EDTA, Heavy Metal, Heavy Metal Ion, Heavy Metals, Hormones, Ion Binding, Ligands, Membrane, Membranes, Metal, Metals, Ni2+, Pluronic, Regeneration, Removal, Reuse, Surfactant, Technology, Zn2+

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Full Text: [2009\Des Wat Tre9, 279.pdf](2009/Des%20Wat%20Tre9,%20279.pdf)

Abstract: The objective of this work is to study at lab-scale the efficiency of a hybrid process coupling ultrafiltration (UF) and adsorption as a pretreatment before seawater reverse osmosis desalination (SWRO). Powdered activated carbon (PAC) and bentonite were used as adsorbents. Actual seawater from Mediterranean Sea was filtered by regenerated cellulose membrane of molecular weight cut-off 30 kDa. The PAC addition allows a decrease of UF fouling rate and an increase of the natural organic matter (NOM) removal, especially for a PAC concentration of 200 mg L-1. An increase of contact time between PAC and seawater induces a reduction of fouling rate. When the contact time increases, the contribution to NOM removal due to PAC adsorption becomes more significant compared to that due to UF alone. Concerning studies with bentonite, the UF fouling rate depends on the bentonite concentration. Addition of more than 500 mg L-1 bentonite can decrease the fouling rate in comparison to ultrafiltration without bentonite. But no obvious improvement of the NOM retention rate was observed. Besides, precoating the membrane with 500 mg L-1 bentonite does not present a major interest since a considerable increase of fouling rate is obtained compared to experiments without precoating. Membrane fouling reversibility, membrane surface hydrophobicity and molecular weight distribution of solutes contained in the different permeates were also studied.

Keywords: Activated Carbon, Adsorption, Adsorption, Bentonite, Carbon, Cellulose, Coagulation, Comparison, Contribution, Filtration, Fouling, Hybrid Process, Hydrophobicity, Membrane, Membrane Fouling, Molecular Weight Distribution, Natural Organic Matter, NOM, NOM Removal, Organics, PAC, Powdered Activated Carbon, Reduction, Removal, Retention, Reverse Osmosis, RO, Seawater, Solutes, UF Membrane, Ultrafiltration, Ultrafiltration, Water

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Full Text: [2009\Des Wat Tre10, 33.pdf](2009/Des%20Wat%20Tre10,%2033.pdf)

Abstract: Trichloroethylene (TCE) is a common contaminant in water and groundwater, known as suspected carcinogens, and its presence in the environment is of significant concern. Nano-scale zero-valent iron (NZVI) has emerged as an excellent reduction catalyst due to fast degradation of chlorinated solvents. However aggregation of NZVI is a serious limitation. In this study, NZVI was coated with nonionic surfactant to overcome its aggregation and to enhance its dispersion. The synthesized NZVI using water-based solution method produced nanowire-like structures mostly and a few portion of NZVI showed a spherical shape. For the modification of NZVI by surfactant, the amount of Tween 80 (R) used to be adsorbed onto NZVI was ca. 8 mmol/kg of NZVI. The volume size distribution of the obtained surfactant modified NZVI (SNZVI) increased to d(90%) (cumulative size at 90%) = 2.03 mu m and at 0.79 mu m of mean size, while that of bare NZVI had diameter with d(90%) (cumulative size at 90%) = 1.4.12 mu m and at 4.54 mu m of mean size. The maximum adsorption amount of humic acid (HA) onto SNZVI was 18.70 mg/g and that of NZVI was 20.05 mg/g. For TCE removal in the presence of HA, SNZVI was not enhanced for TCE removal efficiency, compared with NZVI removal. and TCE removal using SNZVI was inhibited as HA concentration increased, but TCE degradation efficiency increased at high concentration of HA. Based on reduction of size and the reactivity of SNZVI, the present results can be applied for in situ groundwater remediation.

Keywords: Adsorption, Catalyst, Characterization, Contaminants, Dechlorination, Degradation, Dispersion, Environment, Groundwater, Humic Acid, Nanoparticles, Nanoscale Zero Valent Iron, Nonionic Surfactant, Particles, Porous-Media, Reduction, Remediation, Removal, Removal Efficiency, Research, Surfactant, Tetrachloroethylene, Trichloroethylene, Water

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Full Text: [2009\Des Wat Tre10, 47.pdf](2009/Des%20Wat%20Tre10,%2047.pdf)

Abstract: Equilibrium between CMX cationic membrane and solutions of cations at various ionic strengths were studied and the affinity order for different counter-ions was made. Membrane water content and ion exchange capacity were determined. The equilibrating solutions were equimolar mixtures of alkaline nitrates of potassium, sodium and calcium and the ionic strength (1) was varied from 0.1 to 1.5 mol.L-1. All experiments were maintained at constant temperature (25°C). Adsorption isotherms for the five binary systems: Na+/K+, Li+/K+, Li+/Na+, Na+/Ca2+ and K+/Ca2+ were studied. The affinity order observed was: K+ > Ca2+ > Na+ > Li+. Selectivity coefficients K-Na+(K+), K-Li+(K+), K-Li+(Na+), K-2Na+(Ca2+), and K-2K+(Ca2+) were determined at 25°C. The selectivity coefficients decreases with increasing ionic strengtli 2 for low values of I and tended asymptotically to the unity for high values of I.

Keywords: Adsorption, Adsorption Isotherms, Affinity Coefficient, Binary System, Capacity, Electrodialysis, Equilibrium, Exchange Membrane, Ion Exchange, Ion Exchange Membrane, Isotherms, Membrane, Nitrates, Selectivity, Selectivity Coefficients, Sodium, Solutions, Temperature, Waste-Water, Water

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Full Text: [2009\Des Wat Tre10, 317.pdf](2009/Des%20Wat%20Tre10,%20317.pdf)

Abstract: Increased knowledge about toxicological effects of heavy metals on the environment and in drinking water is well recognized and therefore, it is inevitable to search for different methods to reduce water Pollution. The Saharan plant Retama raetam (Fabaceae family) was used as locally available adsorbent for removal of copper ions from aqueous solution. Various biosorption parameters Such as initial metal concentration, pH and temperature on the capacity of copper biosorption were investigated. The relation between the phytochemical composition (polyphenol, alkaloids, terpenoids, carbohydrates) of the aerial parts of Retama raetam and the percent of adsorption for copper ion was examined.

Keywords: Adsorbent, Adsorption, Aqueous, Biomass, Biosorption, Biosorption, Capacity, Composition, Copper, Drinking Water, Environment, Equilibrium, Flavonoids, Heavy Metals, Heavy-Metal, Ions, Knowledge, Marine-Algae, Metal, Metals, Methods, pH, Phytochemical, Removal, Retama Raetam, Sahara, Sawdust, Sorption, Temperature, Wastewater, Water

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Full Text: [2009\Des Wat Tre10, 332.pdf](2009/Des%20Wat%20Tre10,%20332.pdf)

Abstract: An attempt was made to investigate the effect of molecular weight cut-off (MWCO) and applied pressure on the treatment and protein recovery from palm oil mill effluent (POME). Hydrophobic ultrafiltration (UF) membranes, namely polyethersulphone and polysulphone membranes were used in this study although hydrophilic membranes are generally used in the wastewater treatment and protein recovery. In order to reduce significantly the total suspended solids from POME before proceeding with the dead-end UF process, the raw effluent was first subjected to physical pretreatment processes (depth and surface filtrations) and microfiltration process. Then, a polysulphone UF membrane (20,000 MWCO) as well as polyethersulphone UF membranes (10,000 MWCO and 2,000 MWCO) were used in the study at different applied pressures, ranging from I to 10 bar. This study indicated that MWCO and applied pressure imposed a direct effect on permeate flux, POME treatment and protein recovery. In general, the hydrophobic UF membrane with the highest MWCO (20,000 MWCO) and operated at the highest applied pressure (10 bar) gave the best performance of POME treatment and protein recovery, in which case the highest reduction of total suspended solids, turbidity, chemical oxygen demand, total dissolved solids and protein recovery could be obtained up to 98.3%, 96.2%, 82.0%, 41.2% and 78.0%, respectively.

Keywords: Adsorption, Effluent, Flux, Hydrophobic Membrane, Industry, Membrane, Membranes, Microfiltration, Palm Oil Mill Effluent (POME), Pressure, Pressures, Protein Recovery, Recovery, Reduction, Retentate, Reuse, Separation, Treatment, Ultrafiltration, Waste-Water, Wastewater, Wastewater Treatment

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Full Text: [2009\Des Wat Tre11, 46.pdf](2009/Des%20Wat%20Tre11,%2046.pdf)

Abstract: In this study, a pilot scale Side Stream Membrane Filtration System (SSMFS) was used to demonstrate the need for optimization of backwash conditions and the addition of PAC. Through an investigation of the amount of fouling each cycle that can be restored through backwashing over a short-term, a good operating point for long-term operation was developed. Periodic removal of 1.5% of the PAC slurry mixture (75 L out of 500 L) and PAC replacement (15 g/d) was found to have a positive impact on the reduction of membrane fouling.

Keywords: Activated Carbon, Adsorption, Carbon, Effluent, Fouling, Impact, Membrane, Membrane Filtration, Organic Removal, PAC, Pilot Scale Study, Positive, Reduction, Removal, Scale, Sewage Effluent, System, Treatment

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Full Text: [2009\Des Wat Tre11, 52.pdf](2009/Des%20Wat%20Tre11,%2052.pdf)

Abstract: In this study, the critical flux of the submerged membrane system was experimentally evaluated when it was used for seawater with and without pre-treatment. In this study, different processes such as flocculation with ferric chloride (FeCl3) and different doses of PAC adsorption were used as a pre-treatment. The pretreatment of flocculant of 2 mg/L of FeCl3 and adsorption with the dose of 1 g/L PAC showed an improvement in the critical flux from 5 L/m2.h to 6.7 L/m2.h and 13.3 L/m2.h respectively. The performance of these pretreatments was also determined in terms of modified fouling index using ultrafilter membrane (UF-MFI). UF-MFI and SDI indicated that PAC adsorption was a better pretreatment than flocculation for the seawater used in this study. Molecular weight distribution (MWD) of seawater organic matter was also examined after different pretreatments. MWD of the raw seawater was mainly in the range from 1510 to 130 Da. It is observed that FeCl3 flocculation and PAC adsorption as pretreatments partially removed the organic matter of 1510 Da and 130Da respectively.

Keywords: Adsorption, Critical Flux, Flocculation, Flux, Fouling, Membrane, Microfiltration, PAC, Preflocculation, Pretreatment, Seawater, Seawater Desalination, System, Water

? Cao, Y.H., Yan, F., Li, J.X., Liang, X.P. and He, B.Q. (2009), Used lubricating oil recycling using a membrane filtration: Analysis of efficiency, structural and composing. *Desalination and Water Treatment*, **11** (1-3), 73-80.

Full Text: [2009\Des Wat Tre11, 73.pdf](2009/Des%20Wat%20Tre11,%2073.pdf)

Abstract: Three kinds of polymer hollow fiber membranes-polyethersulphone (PES), polyvinylidene fluoride (PVDF), polyacrylonitrile (PAN)-were used for recycling of used lubricating oil. The efficiency of membrane separation was characterized by means of the membrane rejection and the physical and chemical properties of the oils. The separation and analytical methods, for example, Fourier Transform Infrared (FTIR), UV-visible absorption spectra, column chromatography, etc. were employed to illustrate the separation mechanism and the potential structures of used lubricant oil so as to assess the differences between the used lubricating oil and the permeate. Results show that the membrane process can not only remove metal particles and dusts from waste lubricant oil, but also improve its liquidity and flash point. Further, the Ultrafiltration membrane (PAN) has higher rejection than microfiltration membranes (PES and PVDF). The results of FT-IR and UV absorption spectra show that waste lubricant oil has almost 90% long chain saturated hydrocarbons, which are originally from the base oil. The middle polarity compositions may be lactones, esters, aldehydes, ketones, carboxylic acids, which may come from the oxidation of base oil and additives during the use of lubricating oil. Moreover, the molecules of the retentate contain aromatic rings as the basic unit in structure. The conjugated aromatic rings in the unit are mainly composed of two rings and three rings, whose connections are “linear order”, namely cata-condensed. Overall, it will provide Much more reference data for optimizing the regeneration processes of used lubricant oil.

Keywords: Absorption, Adsorption, Chromatography, Column Chromatography, FT-IR, FTIR, Hollow Fiber Membrane, IR Spectrum, Mechanism, Membrane, Membrane Filtration, Membranes, Metal, Methods, Microfiltration, PAN, Particles, Polymer, Recycling, Regeneration, Rejection, Removal, Separation, Used Lubricating Oil, UV-Vis Spectrum, Waste

? Khenniche, L. and Aissani, F. (2009), Characterization and utilization of activated carbons prepared from coffee residue for adsorptive removal of salicylic acid and phenol: Kinetic and isotherm study. *Desalination and Water Treatment*, **11** (1-3), 192-203.

Full Text: [2009\Des Wat Tre11, 192.pdf](2009/Des%20Wat%20Tre11,%20192.pdf)

Abstract: In this work, coffee residue was used as source material to prepare activated carbons by chemical activation with zinc chloride. The influence of impregnation ratio (Zinc chloride/coffee residue) on the physical and chemical properties of prepared carbons is studied in order to optimize this parameter. Texture properties of these carbons were determined by measuring the adsorption of nitrogen at 77 K. The nitrogen adsorption isotherms were interpreted by BET and Dubinin-Radushkevick (D-R) equations. The nature of carbon surface functionalities was studied by Boehm titration method. Phenol and salicylic acid removal from aqueous solutions by adsorption onto the prepared activated carbons was investigated. The effect of parameters such as pH, agitation time, initial phenol and salicylic acid concentrations, temperature, adsorbent dosage and particle size on phenol and salicylic acid removal were observed. In addition, adsorption kinetics and adsorption isotherms Study were realized. Maximum phenol removal was obtained at pH 3 and 20°C, while for salicylic acid it was obtained at pH 3 and 25°C. In the isotherm studies, Langmuir and Freundlich isotherm models were applied and it was observed that the phenol experimental data were perfectly described by the Langmuir model while the salicylic acid experimental data were correctly fitted by both Langmuir and Freundlich equations. Batch adsorbent capacity (*q*m) was calculated as 55 mg/g for phenol and 128 mg/g for salicylic acid. The rates of adsorption were found to conform to pseudo-second-order kinetics with good correlation.

Keywords: 77 K, Activated Carbon, Activated Carbons, Activation, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Agitation, Aqueous Solutions, Aqueous-Solutions, BET, Capacity, Carbon, Characterization, Chemical, Chemical Activation, Chloride, Coffee Residue, Correlation, Data, Equilibrium, Experimental, Fly-Ash, Freundlich, Freundlich Isotherm, Impregnation, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Model, Methylene-Blue, Model, Modelling, Models, Nitrogen, Nov, Particle Size, pH, Phenol, Phenol Removal, Physical, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Rates, Removal, Salicylic Acid, Size, Solutions, Source, Surface, Temperature, Utilization, Water, Work, Zinc, Zinc Chloride

? Sen, M. and Pal, P. (2009), Treatment of arsenic-contaminated groundwater by a low cost activated alumina adsorbent prepared by partial thermal dehydration. *Desalination and Water Treatment*, **11** (1-3), 275-282.

Full Text: [2009\Des Wat Tre11, 275.pdf](2009/Des%20Wat%20Tre11,%20275.pdf)

Abstract: Experimental investigations were carried out to remove arsenic from contaminated groundwater by low cost activated alumina based adsorbent prepared by partial thermal dehydration. Activated alumina based adsorbent with high surface area was prepared following partial thermal dehydration of gibbsite precursor and an attempt was made to study the effects of dehydration temperature, residence time, rate of increase of temperature and particle size on development of active surface area of the adsorbent. The operating parameters were found to have significant effect on active surface area development. BET Surface area (by nitrogen adsorption) and ignition losses were determined for all the samples. It was found that an adsorbent of surface area of around 335-340 m(2)/g could be developed when dehydrated at 500°C for a residence time of 30 min in a rapid heating system (rate of increase of temperature 200°C/min) with particle size of 200 mesh (85%). The arsenic adsorption capacity of this adsorbent was determined both in batch and column studies. The adsorbent was found to be very effective in removing arsenic. The adsorbent placed in column could successfully remove arsenic from water up to a level below 10 mu g/L for more than 6000 bed volume water.

Keywords: Activated Alumina, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Surface, Arsenic, Arsenic Adsorption, Capacity, Development, Drinking-Water, Gibbsite, Groundwater, Nitrogen, Particle Size, Removal, Residence Time, Surface Area, System, Temperature, Thermal Dehydration, Water

? Maheswari, S. and Murugesan, A.G. (2009), Biosorption of arsenic(III) ion from aqueous solution using Aspergillus fumigatus isolated from arsenic contaminated site. *Desalination and Water Treatment*, **11** (1-3), 294-301.

Full Text: [2009\Des Wat Tre11, 294.pdf](2009/Des%20Wat%20Tre11,%20294.pdf)

Abstract: The biosorption of As(III) ion onto the dry biomass of Aspergillus fumigatus isolated from the arsenic contaminated soil. The effect of initial As(III) ion concentration (100-260 ppm), pH (3, 4, 5) and temperature (25, 30, 35°C) on arsenic removal has been investigated. In addition the polarity and surface energy of the fungal biomass was determined by FTIR spectroscopy. The biosorbents varied with the pH of the medium and the maximum biosorption at initial concentration of 180 ppm of As(III) ion was obtained at pH-5. The effect of temperature on the biosorbents was varied with different As(III) ion concentration and the maximum adsorption occurred at 35°C. The maximum biosorption capacity (q(m)) of fungal biomass were 106, 101 and 134 ppm at pH-3, 4 and 5 respectively. Similarly at 25, 30 and 35°C the maximum biosorption capacity (q(m)) were 144,125 and 175 ppm respectively for As(III) ion per gram of dry biosorbent. The experimental biosorption equilibrium data for As(III) ion were in good agreement with those calculate by Langmuir and Freundlich model.

Keywords: Adsorption, Aqueous, Arsenic, As(III), As(III) Ion, Aspergillus Fumigatus, Biomass, Biosorbent, Biosorbents, Biosorption, Ca-Alginate, Cadmium(II), Capacity, Contaminated Soil, Equilibrium, Freundlich, FTIR, FTIR Spectroscopy, Fungal Biomass, Heavy-Metals, Kinetics, Langmuir, Model, pH, Phanerochaete-Chrysosporium, Removal, Saccharomyces-Cerevisiae, Soil, Sorption Performance, Spectroscopy, Temperature, Water, White-Rot Fungus

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Full Text: [2009\Des Wat Tre11, 302.pdf](2009/Des%20Wat%20Tre11,%20302.pdf)

Abstract: Dyes are usually present in trace quantities in the treated effluents of many industries. This study investigates the potential use of Eucalyptus bark powder (EBP) as an adsorbent for adsorption of industrially important dyes namely malachite green, indigo carmine and methylene blue from wastewater. The operating variables studied are initial dye concentration, pH, temperature and contact time. It was noted that adsorption of all the dyes on Eucalyptus bark powder increases with an increase in pH and temperature. The equilibrium data are fitted to Langmuir in comparison to Freundlich isotherm equations. From these results adsorption efficiency, energy, capacity, intensity and dimensionless separation factor are also calculated. Adsorption isotherm modeling shows that the interaction of the dyes with Eucalyptus bark powder surface is localized monolayer adsorption. The adsorption of all the three dyes followed the pseudo-second order rate kinetics, Bangham’s equation was also used to further check the kinetic model. On the basis of kinetic studies, various rate and thermodynamic parameters such as Gibbs free energy, enthalpy and entropy were evaluated. Influence of temperature on the removal of dye from aqueous solution shows the feasibility of adsorption and its endothermic nature. The results of the study shows that the Eucalyptus bark powder can be used as a potential adsorbent for dyes in wastewater/water.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Aqueous Solution, Aqueous-Solution, Biomass, Biosorption, Capacity, Characteristics, Chlorophenols, Colorants, Comparison, Concentration, Data, Dye, Dyes, Efficiency, Effluents, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Eucalyptus, Eucalyptus Bark, Feasibility, Freundlich, Freundlich Isotherm, Gibbs Free Energy, Interaction, Isotherm, Isotherm Equations, Isotherm Modeling, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Kinetics, Langmuir, Malachite Green, Metal-Ions, Methylene Blue, Methylene-Blue Adsorption, Model, Modeling, Monolayer, NOV, Part I, pH, Potential, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Kinetics, Removal, Separation, Solution, Surface, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste Treatment, Waste-Water, Wastewater

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Full Text: [2009\Des Wat Tre11, 318.pdf](2009/Des%20Wat%20Tre11,%20318.pdf)

Abstract: Activated carbon (AC) is an effective adsorbent for organic molecules but not for small and polar compounds, such as metals and oxyanions. This study presents preliminary results of a series of commercially prepared specifically modified activated carbons, aiming at removal of oxyanions and heavy metals. Breaktrough experiments were performed for chromate, arsenate, perchlorate and nickel, with concentrations between 700-9000 ppb. Complete removal of pollutants is observed for hundreds to thousands of bed volumes depending on the pollutant concentration. Exhausted columns with chromate were regenerated for reuse during at least seven cycles, and performance was slightly reduced (270 pore volumes at the 7th cycle, compared with 300 pore volumes at the 1st cycle). A pilot filtering device of 60 l was established in a metal plating factory, which has operated successfully for five months at least. A sorption kinetics experiment was performed at the pilot site, by adding a known amount of chromate and measuring reduction in its concentration with time. Measured results follow first order sorption kinetics, coinciding fully with theoretically evaluated rate constant, indicating complete removal.

Keywords: Activated Carbon, Activated Carbons, Adsorbent, Adsorbents, Adsorption, Adsorption, Aqueous-Solutions, Arsenate, Arsenic, Breakthrough Diagram, Carbon, Chromate, Chromium, Chromium, First Order, Heavy Metals, Ions, Kinetics, Metal, Metals, Nickel, Oxyanions, Perchlorate, Reduction, Removal, Reuse, Sorption, Sorption Kinetics, Water

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Full Text: [2009\Des Wat Tre12, 3.pdf](2009/Des%20Wat%20Tre12,%203.pdf)

Abstract: This study evaluated the effectiveness of a new adsorbent system (AM-Fe-PGCP), iron(III) complex of an amino-functionalized poly(acrylamide)-grafted coconut coir pith (CP) for the removal of chromium(VI) from aqueous solutions. The adsorbent was prepared through graft copolymerization of acrylamide onto CP in the presence of N,N’-methylenebisacrylamide using potassium peroxidisulphate initiator, followed by treatment with ethylenediamine and ferric chloride in acid (HCl) medium. The adsorbent was well characterized using FTIR, SEM, XRD, TG/DTG, surface area analyzer and potentiometric titrations. The ability of AM-Fe-PGCP to remove Cr(VI) from water and industrial effluent was tested using batch adsorption experiments. The effects of contact time, initial sorbate concentration, pH, dose of adsorbent and temperature were studied to optimize the conditions for maximum adsorption. The adsorption kinetics data were best described by the pseudo-second-order rate equation. The mechanism of sorption was found to be film diffusion controlled. Equilibrium isotherm data were analysed by the Langmuir and Freundlich equations. The best interpretation for the equilibrium data was given by the Langmuir isotherm and the maximum adsorption capacity was estimated to be 135.5 mg g-1 at 30ºC. NaOH Solution (0.1 M) was found to be capable of regenerating the spent adsorbent. Simulated industry wastewater sample was also treated by the AM-Fe-PGCP to demonstrate its efficiency in removing Cr(VI) from wastewater.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Kinetics, Aqueous Solutions, Aqueous-Solutions, Batch, Batch Adsorption, Capacity, Chloride, Chromium(VI), Coconut Coir Pith, Coir Pith, Concentration, Copolymerization, Cr(VI), Cu(II), Data, Desorption, Diffusion, Effectiveness, Efficiency, Effluents, Equilibrium, Equilibrium Isotherm, Ethylenediamine, Experiments, Ferric Chloride, Film Diffusion, Freundlich, FTIR, Graft, Graft Copolymerization, Graft Copolymers, Heavy-Metals, Industrial Effluent, Ions, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Lignocellulosics, Mechanism, NaOH, pH, Pith, Potassium, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Removal, SEM, Solutions, Sorbate, Sorption, Surface, Surface Area, Temperature, Thermodynamics, Treatment, Wastewater, Water, XRD

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Full Text: [2009\Des Wat Tre12, 16.pdf](2009/Des%20Wat%20Tre12,%2016.pdf)

Abstract: Removal of uranium [U(VI)] from aqueous solutions with humic acid-immobilized zirconium-pillared clay (HA-Zr-PILC) was investigated using batch adsorption technique. Maximum removal of 99.2% was observed for an initial concentration of 25 mg L-1 at pH 6.0 and an adsorbent dose of 2 g L-1. Equilibrium was achieved in approximately 4 h. The adsorbent was characterized using, XRD, FTIR, SEM, TG/DTG surface area analyzer and potentiometric titration. The effects of pH, contact time, initial concentration and adsorbent dose on removal process were evaluated. The experimental kinetic and isotherm data were analyzed using a second-order kinetic equation and Langmuir isotherm model, respectively. The monolayer adsorption capacity for U(VI) removal was found to be 134.65±4.07 mg g-1. Adsorption experiments were also conducted using a commercial cation exchanger, with carboxylate functionality for comparison. Adsorption efficiency was tested using a simulated nuclear industry effluent sample. Experimental results obtained from repeated adsorption/desorption cycles indicate that the adsorbent can be potentially applied for the removal and recovery of U(VI) ions from various aqueous solutions.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Behavior, Adsorption Capacity, Adsorption Kinetics, Aqueous, Aqueous Solutions, Batch Adsorption, Capacity, Clay, Comparison, Effluent, Equilibrium, FTIR, Humic Acid, Ions, Isotherm, Kinetic, Langmuir, Langmuir Isotherm, Model, Montmorillonite, pH, Phase, Pillared Clay, Potentiometric Titration, Recovery, Regeneration, Removal, Second Order, SEM, Silica, Solutions, Surface Area, U(VI), Uranium, Waste-Water, XRD, Zeolite

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Full Text: [2009\Des Wat Tre12, 87.pdf](2009/Des%20Wat%20Tre12,%2087.pdf)

Abstract: In the present study, zirconium diethylene triamine pentamethylene phosphonate (ZrDETPMP), a hybrid ion exchanger of the class of tetravalent metal acid (TMA) salt, has been synthesized by soft chemistry route, sol-gel method. The material was characterized for elemental analysis (ICP-OES and CHN analyzer), thermal analysis (TGA), spectral analysis (FT-IR), X-ray diffraction and SEM. Chemical resistivity of the material was assessed in various media (acids, bases and organic solvents). Ion exchange capacity was determined and the effect of calcination on ion exchange capacity (IEC) was studied. The distribution behaviour (K-d) in different electrolyte media/concentrations, breakthrough capacity and elution behaviour of metal ions La3+, Ce3+, Pr3+, Nd3+, Sm3+ and Th4+ were studied and discussed.

Keywords: Adsorption, Behavior, Breakthrough, Calcination, Capacity, Cation-Exchanger, Characteristics, Characterization, Chemistry, FT-IR, FTIR, Hybrid Ion Exchanger, ICP-OES, Ion Exchange, Metal, Metal Ions, Metal Phosphonate, Phosphate, Phosphonate, Sem, Sol-Gel, Synthesis, Tetravalent Metal Acid Salt, X-Ray Diffraction, Zirconium Phosphonate

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Full Text: [2009\Des Wat Tre12, 100.pdf](2009/Des%20Wat%20Tre12,%20100.pdf)

Abstract: Palm shell (Borassus Flabellifer), a ligno-cellulosic agrowaste is used as adsorbent for the removal of Hg(II). A series of experiments were conducted in a batch system to evaluate the effect of system variables. The optimal pH value of mercury(II) adsorption onto palm shell powder was found to be pH 3.0-7.0. The maximum uptake capacity was found 0.04425 mg/g. The pseudo second order rate equation was found to be the best fit for the kinetic data obtained. The equilibrium data were found to follow both Freundlich and Langmuir isotherm models with high coefficients of determination.

Keywords: Activated Carbon, Adsorbent, Adsorbent Kinetics, Adsorption, Agrowaste, Aqueous Solution, Batch, Batch System, Biosorbent, Biosorption, Capacity, Copper, Data, Equilibrium, Equilibrium and Kinetic Studies, Experiments, Freundlich, Heavy-Metals, Hg(II), Isotherm, Kinetic, Kinetic Studies, Langmuir, Langmuir Isotherm, Mercury, Mercury II, Mercury(II), Mercury(II) Adsorption, Models, Natural Adsorbent, Nonlinear Methods, Palm Shell Powder, pH, pH Value, Pseudo Second Order, Pseudo-Second-Order, Removal, Second Order, Second-Order, Solution, Sorption, Thermodynamic Parameters, Uptake, Value, Waste

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Full Text: [2009\Des Wat Tre12, 127.pdf](2009/Des%20Wat%20Tre12,%20127.pdf)

Abstract: Hydrotalcite and similar compounds are found to be a potential adsorbent for removal of different metal ions. In present work we have synthesized a low-cost hydrotalcite-like compound, takovite, using the co-precipitation method. Further, part of the synthesized material was calcined at 773 K. Both normal and calcined takovite were characterized by XRD. Using this hydrotalcite-like compound the adsorption of Zn was studied in industrial effluents in a batch system by keeping different agitation times (15-1020 min), varying pH in the range 2-6 and varying the temperature in the range 283-313 K. In the controlled conditions, the percentage adsorption of Zn was found to be 76% and 93% for normal and calcined takovite respectively. The equilibrium isotherm data were analysed using Freundlich isotherm model. The values of log a and 1/b were found to be 0.778 and 0.081 for normal and 0.88 and 1.44 for calcined takovite, respectively, and the correlation coefficient (r(2)) was 0.9849 and 0.9945 for normal and calcined takovite, respectively.

Keywords: Adsorbent, Adsorption, Aqueous-Solution, Batch System, Calcined Takovite, Clay, Co-Precipitation, Copper(II), Correlation, Electrodialysis, Equilibrium, Equilibrium Isotherm, Freundlich, Freundlich Isotherm, Heavy-Metal, Hydrotalcite, Hydrotalcite-Like Compound, Isotherm, Low-Cost Adsorbents, Metal, Metal Ions, Model, pH, Pulp, Removal, System, Takovite, Temperature, Thermal-Decomposition, Waste-Water, XRD

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Full Text: [2009\Des Wat Tre12, 202.pdf](2009/Des%20Wat%20Tre12,%20202.pdf)

Abstract: Color and turbidity removal from Solutions of two reactive dyes: brilliant blue Levafix EBRA and gold yellow Levafix EG were studied. Coagulation-flocculation by polyaluminium hydroxide (PAH) and bentonite, followed by adsorption on powdered activated carbon (PAC) techniques were used. Optimal parameters of coagulation-flocculation (jar tests) and adsorption (temperature, pH, contact time and PAC concentration) were determined under optimal conditions for maximal dye elimination. 99.89% and 99.02% of color removal were obtained from 100 mg/L of dye solutions, respectively. Bentonite and aluminum used concentrations were 0.50 g/L and 27.6 mg/L (blue EBRA); also 0.37 g/L and 15.0 mg/L (yellow EG), coupled with 1.0 g/L of PAC for each dye. At suitable conditions this combined process was able to efficiently remove color from solutions containing reactive dyes and produce easily settle-able sludge, using moderate amounts of reagents, and thereby the low-cost of treatment.

Keywords: Activated Carbon, Activated-Sludge, Adsorption, Adsorption, Aluminum, Aqueous-Solution, Azo-Dye, Bentonite, Carbon, Coagulation, Coagulation, Color Removal, Decolorization, Dye, Dyes, Elimination, Flocculation, PAC, PAH, pH, Photochemical Oxidation, Powdered Activated Carbon, Reactive Dye, Reactive Dye Solutions, Reactive Dyes, Removal, Response-Surface Methodology, Sludge, Solutions, Techniques, Temperature, Textile Waste-Water, Treatment

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Full Text: [2009\Des Wat Tre12, 210.pdf](2009/Des%20Wat%20Tre12,%20210.pdf)

Abstract: Adsorption of neutral red (NR) onto rice husk from aqueous solutions was investigated. Experiments were carried out as a function of pH, adsorbent dosage, contact time and dye concentration. The equilibrium adsorption data were analyzed by Langmuir, Freundlich, Redlich-Peterson models using nonlinear regressive analysis. The results indicated that the Langmuir and Redlich-Peterson models provided the best correlation of the experimental data. The adsorption capacities of NR adsorption onto rice husk from Langmuir model were 25.16, 29.15, 32.37 mg/g at 288, 308, 318 K, respectively. Adsorption kinetic data were fitted using the pseudo-first-order kinetic model and pseudo-second-order kinetics. It was shown that the pseudo-first-order and second-order kinetic equations could describe the adsorption kinetics. The process mechanism was found to be complex, consisting of both surface adsorption and pore diffusion. The effective diffusion parameter D. values estimated in the order of 10-9 cm2/s indicated that the intraparticle diffusion was not the rate-control ling step. Using the equilibrium concentration constants obtained at different temperatures, various thermodynamic parameters, such as ΔG°, ΔH° and ΔS°, have been calculated. The thermodynamics parameters of NR/rice husk system indicated spontaneous and endothermic process. It was implied that rice husk may be suitable as adsorbent material for adsorption of NR from aqueous solutions.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacities, Adsorption Isotherms, Adsorption Kinetic, Adsorption Kinetics, Agricultural Waste, Analysis, Aqueous Solutions, Aqueous-Solution, Basic Dye, Concentration, Correlation, Data, Diffusion, Dye, Dye Removal, Endothermic, Equilibrium, Experimental, Freundlich, Function, Heavy-Metals, Intraparticle Diffusion, Kinetic, Kinetic Equations, Kinetic Model, Kinetics, Langmuir, Langmuir Model, Low-Cost Adsorbents, Malachite Green, Mechanism, Methylene-Blue Adsorption, Model, Models, Neutral Red, pH, Pore Diffusion, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Redlich-Peterson, Rice, Rice Husk, Rice-Husk, Second Order, Second-Order, Solutions, Surface, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water

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Full Text: [2009\Des Wat Tre12, 219.pdf](2009/Des%20Wat%20Tre12,%20219.pdf)

Abstract: Flyash has been explored in the laboratory scale experiment as a low cost adsorbent for the removal of methylene blue dye from aqueous solution. The influence of dye concentration, weight of adsorbent, stirring rates, influence of temperature, pH on adsorption capacity was studied in batch experimental method. From experimental results it was observed that almost 95-99% of dye colour could be removed from the solution using flyash at different initial conditions. Langmuir, Freundlich and Tempkin isotherm models were used to describe the distribution of dye between the liquid and solid phases in batch studies and it has observed that Langmuir isotherm better represents the phenomenon than Freundlich and Tempkin isotherms. From the experimental results the adsorption rate constant, activation energy, Gibbs free energy, enthalpy and entropy of the reaction were calculated in order to determine the mechanism of the sorption process.

Keywords: Activation, Activation Energy, Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Kinetics, Adsorption Rate, Aqueous, Aqueous-Solutions, Biosorbent, Biosorption, Capacity, Desulfurization, Dye, Entropy, Equilibrium, Experimental Method, Freundlich, Isotherm, Isotherms, Kinetics, Langmuir, Langmuir Isotherm, Mechanism, Methylene Blue, Models, Peanut Hull, pH, Reduction, Removal, Rice Husk, Scale, Sorption, Temperature, Thermodynamic Parameters, Thermodynamics

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Full Text: [2009\Des Wat Tre12, 238.pdf](2009/Des%20Wat%20Tre12,%20238.pdf)

Abstract: In the present study sawdust, a timber industry waste has been investigated as an adsorbent for the removal of Cr(VI) from synthetic wastewater. Batch mode experiments have been conducted by varying various process parameters including pH, Cr(VI) concentration, adsorbent dose and contact time. Cr(VI) removal was maximum at pH 2. Efficiency of sawdust for Cr(VI) removal from dilute wastewater was 80% at 20 g L-1 adsorbent dose. FTIR spectra were recorded to explore number and position of the functional groups available for the binding of Cr(VI) ions onto sawdust. SEMs and EDAX of the adsorbents were recorded to explore the morphology and elemental constitution of the adsorbents. Langmuir, Freundlich and Dubinin-Radushkevich adsorption isotherms were also tested. Pseudo-second order model explains the Cr(VI) kinetic more effectively. Reusability of the adsorbents was examined by desorption in which HCl eluted 79.63% Cr(VI).

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption Isotherms, Aqueous Solution, Batch, Binding, Biomass, Biosorption, Chromium, Concentration, Cr(VI), Cr(VI) Removal, Desorption, EDAX, Experiments, Freundlich, FTIR, FTIR Spectra, Functional Groups, Heavy-Metals, Ions, Isotherm, Isotherms, Kinetic, Kinetics, L1, Langmuir, Mode, Model, Morphology, pH, Pseudo-Second Order, Pseudo-Second-Order, Removal, Sawdust, Sawdust, Solution, Temperature, Thermodynamics, Uptake, Waste, Wastewater

? Amarnath, N., Chakrabarti, P.P., Venkateshwar, S. and Kale, V. (2009), A novel approach for treatment of a typical perfumery chemical wastewater for possible reuse. *Desalination and Water Treatment*, **12** (1-3), 256-261.

Full Text: [2009\Des Wat Tre12, 256.pdf](2009/Des%20Wat%20Tre12,%20256.pdf)

Abstract: Heptaldehyde is a very important castor oil based perfumery chemical. This is produced by pyrolyzing castor methyl esters (CME). In this process large volumes of water are required and the wastewater produced is contaminated with heptaldehyde and other by products. The presence of heptaldehyde - a malodorous compound, causes serious problems to the nearby locality if the contaminated water is discharged without proper treatment. In the present investigation, a process was developed for the treatment of aldehyde contaminated perfumery chemicals wastewater. As the common coagulants such as alum, ferric chloride, alginic acid and chitosan either alone or in combination with powdered activated charcoal (PAC) as adsorbent did not have any desired effect, a novel pretreatment process was developed using sodium borohydride as reducing agent. This was followed by membrane processing. The process parameters for using both the reducing agent and PAC as adsorbent were optimized keeping in mind the removal of mal-odor of the wastewater samples. The pretreated water was first filtered using a micron filter and then processed through a reverse osmosis membrane. The final treated water was clear, odorless and the quality of the water was found to be suitable for reuse.

Keywords: Activated Carbon, Adsorbent, Adsorption, Alginic Acid, Chitosan, Coagulation, Heptaldehyde, Membrane, Mind, Pac, Performance, Perfumery Chemicals, pH, Powdered Activated Charcoal (PAC), Processing, Reducing Agent, Removal, Reuse, Reverse Osmosis, Reverse Osmosis (RO), Sodium, Sodium Borohydride, Sodium-Borohydride, Treatment, Wastewater, Water

? Mahtab, A., Tariq, M., Shafiq, T. and Nasir, A. (2009), Coagulation/adsorption combined treatment of slaughterhouse wastewater. *Desalination and Water Treatment*, **12** (1-3), 270-275.

Full Text: [2009\Des Wat Tre12, 270.pdf](2009/Des%20Wat%20Tre12,%20270.pdf)

Abstract: This study focused on the treatment of slaughterhouse wastewater characterized as having exceptionally high BOD, COD and TSS contents. A combined treatment system of coagulation and adsorption onto activated carbon was applied for the effluent treatment. Different coagulants, including alum, lime, ferrous sulfate, and ferric chloride were used individually and in combination. Ajar test method was applied to determine the optimal dose of these coagulants. The sludge formation and COD measurements were made in each treatment type. Increasing dosages of coagulants increased the sludge formation and COD removal. Volume of sludge was found to be an indicator of maximum removal of COD. Alum was proved to be the best coagulant in removing COD up to 92%. Maximum sludge volume (400 ml/L) was also observed with alum. More than 90% removal efficiency in pollution load was observed at the set optimal conditions with coagulation process. A combination of coagulation and adsorption processes made negligible improvement in the removal efficiency of the system and removed pollution load up to 96%.

Keywords: Activated Carbon, Adsorption, Bod, Carbon, Coagulation, Cod, Cod Removal, Effluent, Flocculation, Pollution, Reactor, Removal, Removal Efficiency, Slaughterhouse Wastewater, Sludge, Sulfate, System, Treatment, Wastewater

? Hannachi, Y., Shapovalov, N.A. and Hannachi, A. (2009), Adsorption of nickel from aqueous solution by the use of low-cost adsorbents. *Desalination and Water Treatment*, **12** (1-3), 276-283.

Full Text: [2009\Des Wat Tre12, 276.pdf](2009/Des%20Wat%20Tre12,%20276.pdf)

Abstract: The removal of Ni(II) from aqueous solution by different adsorbents was investigated. Calcined phosphate, red mud, clarified sludge (a steel industry waste material) were used for the adsorption studies. The influence of pH, contact time, initial metal concentration, adsorbent nature and concentration on the selectivity and sensitivity of the removal process was investigated. The adsorption process was found to follow a first-order rate mechanism and rate constant was evaluated at 30°C. Langmuir and Freundlich adsorption isotherms fit well in the experimental data and their constants were evaluated. The thermodynamic equilibrium constant and the Gibbs free energy were calculated for each system. The adsorption capacity (q(max)) calculated from Langmuir isotherm and the values of Gibbs free energy obtained showed that Calcined phosphate has the largest capacity and affinity for the removal of Ni(II) compared to the other adsorbents used in the study.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherms, Aqueous, Cadmium, Calcined Phosphate, Capacity, Clarified Sludge, Equilibrium, First Order, First-Order Rate Mechanism, Freundlich, Freundlich Isotherm, Gibbs Free Energy, Heavy-Metals, Isotherm, Isotherms, Langmuir, Langmuir Isotherm, Low-Cost Adsorbents, Mechanism, Metal, Ni(II), Nickel, pH, Phosphate, Red Mud, Removal, Sludge, Sorbent, System, Thermodynamic, Waste, Water

? Ma, Z., Wang, M., Wang, D. and Gao, C.J. (2009), Investigation on overall charged behavior of polyamide nanofiltration membranes by electrokinetic method. *Desalination and Water Treatment*, **12** (1-3), 284-291.

Full Text: [2009\Des Wat Tre12, 284.pdf](2009/Des%20Wat%20Tre12,%20284.pdf)

Abstract: In this paper, the overall charged behavior of polyamide nanofiltration membranes, including their skin-layer and support-layer, was explored by electrokinetic method. Based on trans-membrane streaming potentials of two polyamide nanofiltration membranes (NF90 and NF) measured in a given series of electrolyte solutions (NaCl, KCl, CaCl2, Na2SO4 and MgSO4), respectively, the corresponding zeta potential and charge density were estimated by means of the Helmholtz-Smoluchowski equation and the Gouy-Chapmann double-electric layer theory. The experimental results show that the factors, such as concentration of electrolyte solution, type and valence of ions, have an important influence on the charged behavior of polyamide nanofiltration membranes. Furthermore, it was also found that the relationship between the charge densities and the feed solution concentration agreed well with Freundlich adsorption isotherms under certain testing conditions. Furthermore, it was confirmed that charge formation of polyamide nanofiltration should be attributed to the specific adsorption of ions.

Keywords: Adsorption, Adsorption Isotherms, Charge Densities, Electrokinetic Method, Electrolyte-Solutions, Freundlich, Isotherms, Membranes, Nanofiltration, Polyamide Nanofiltration Membrane, Reverse-Osmosis, Solutions, Specific Adsorption, Streaming Potential Measurements, Surface-Charge, Theory, Tool, Transport, Ultrafiltration Membranes

? Ma, P., Zhang, D. and He, H.J. (2009), Effect of competitive interference on biosorption of cadmium by immobilized Lentinus edodes residue. *Desalination and Water Treatment*, **12** (1-3), 292-298.

Full Text: [2009\Des Wat Tre12, 292.pdf](2009/Des%20Wat%20Tre12,%20292.pdf)

Abstract: Use polyvinyl alcohol-Na-alginate (PVA-SA) to immobilize Lentinus edodes residue for Cd2+ removal. In a single-metal solution, the biosorption of Cd2+ reached equilibrium within 7 h which can be well described by a pseudo-second-order model, with equilibrium biosorption 0.2008 mg/g; 4-7 was the suitable pH value for Cd2+ biosorption by immobilized fungus, a much wider range than that required by mobilized fungus. Unlike the single-metal solution, the Cd2+ biosorption ratio in a two-metal solution increased linearly as the pH values increased. When the concentration of the interferential ion (Cu2+/Pb2+) increased, Cd2+ biosorption decreased significantly (p = 0.01). Isotherm analysis showed that Cd2+ biosorption increased as the initial concentration in a single-metal solution increased. When the initial Cd2+ concentration in the two-metal solution increased, the biosorption increased at first, but when the Cd2+ concentration was over 90 mg/g, a remarkable decrease occurred. Langmuir, Freundlich, Dubinin-Radushkevich and Langmuir-Freundlich isotherm models were fit to the experimental data. The Langmuir model fit the Cd2+ isotherm biosorption best, with correlation coefficients of 0.9981 in Cd2+ single-metal Solution and 0.9291 in a Cd2+-Pb2+ solution. The D-R isotherm fit the Cd2+ isotherm biosorption in the Cd2+-Cu2+ solution with a correlation coefficient of 0.9623.

Keywords: Analysis, Biosorption, Biosorption Isotherm, Cadmium, Cd2+, Competitive, Concentration, Correlation, Correlation Coefficient, D-R Isotherm, Data, Equilibrium, Experimental, First, Freundlich, Fungus, Immobilization, Immobilized, Interference, Isotherm, Kinetics, L. Edodes, Langmuir, Langmuir Model, Langmuir-Freundlich, Langmuir-Freundlich Isotherm, Lentinus Edodes, Model, Models, Pb(II), pH, pH Value, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Range, Removal, Solution, Two-Metal Solution, Value, Vulgaris, Yeast

? Zvezdov, A.T., El Shemeri, A. and Zvezdova, D.T. (2009), Phenol removal multi cell small water treatment device. *Desalination and Water Treatment*, **12** (1-3), 299-304.

Full Text: [2009\Des Wat Tre12, 299.pdf](2009/Des%20Wat%20Tre12,%20299.pdf)

Abstract: A conical one body multi cell, multistage water treatment filtration devices are designed to realize a couple of different processes. Their properties can be used for different technological processes (filtration, ion-exchange, active carbon sorption, etc.). As an example, the devices are studied experimentally for effective technological removal of organic contaminants (phenols) from water using polymeric adsorbents strong-base anion exchange and active carbon sorption materials. These attempts to combine three processes in one filtration body did show successful results, while the small water treatment devices still being affordably priced. The main contribution of these devices is that they have very compact simple design, simple operative procedures, reduced quantity of valves for treated water and reagent flow regulation. The conical shape of the conical one body multi cell multistage water treatment filtration device ensures linear flow rate to slow down on its path. This hydraulic phenomenon plays a positive role during the sorption processes. The devices could be used as a small water treatment module for local drinking water treatment, etc.

Keywords: Adsorption, Anion Exchange, Aqueous-Solutions, Carbon, Contaminants, Contribution, Drinking Water, Drinking Water Treatment, Ion Exchange, Local, Multi Cell Filter, Multistage Filter, Phenol, Phenol Removal, Positive, Regulation, Removal, Small Water Treatment Device, Sorption, Treatment, Wastewaters, Water, Water Treatment

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Full Text: [2009\Des Wat Tre12, 344.pdf](2009/Des%20Wat%20Tre12,%20344.pdf)

Abstract: The use of nanotechnologies in water treatment for the removal of natural organic matter (NOM) is a relatively new concept. Using simple self-assembled monolayer (SAM) techniques, a silica substrate was modified as an adsorbent and tested for its potential for reduction of water quality parameters such as UV absorbance, colour and dissolved organic carbon (DOC). Silica particles that were coated with an amino-siloxane SAM (NH2-SAM) were evaluated in both a high surface area powder form and also a more realistic granular sand form. Initial results using direct stirred contact with powdered NH2-SAM showed promising results with 60% reduction of UV254 after 1 h and up to 70% removal of DOC with higher doses and contact times. NH2-SAM powder removed NOM in a broader and less selective molecular weight (MW) range than coagulation treatment and this removal was enhanced by pH control at 6, especially for medium MW components. When NH2-SAM sand was applied, the significantly reduced effective surface area resulted in lower DOC removal but colour removal was still considerable for realistic treatment plant contact times. Attempted regeneration with acidic solutions showed greater effectiveness at lower applied pH, however recovery of adsorption capacity reduced with successive adsorption/regeneration cycles highlighting the need for further refinement of operating conditions for more effective application of this relatively simple water treatment technology.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Alum Coagulation, Capacity, Carbon, Character, Coagulation, DOC, Effectiveness, Films, Filtration, Fractionation Technique, Impact, Interfaces, Natural Organic Matter, NOM, Particles, Performance, pH, Recovery, Reduction, Regeneration, Removal, Sand, Self-Assemble Monolayer, Silica, Solutions, Surface Area, Techniques, Technology, Treatment, Water, Water Quality, Water Treatment

? Okoronkwo, A.E., Aiyesanmi, A.F. and Olasehinde, E.F. (2009), Biosorption of nickel from aqueous solution by *Tithonia diversifolia*. *Desalination and Water Treatment*, **12** (1-3), 352-359.

Full Text: [2009\Des Wat Tre12, 352.pdf](2009/Des%20Wat%20Tre12,%20352.pdf)

Abstract: This study investigated the feasibility of Mexican sunflower (Tithonia diversifolia), a common plant that inhabits the highway of the south western Nigeria, as a novel biosorbent for nickel from solutions. pH profile, time dependency and cation interference studies were conducted using stem biomass of this plant. Nickel uptake exhibited substantial enhancement both in terms of the kinetics of uptake as well as the loading capacity. Results of the investigation showed that the unmodified biomass was able to remove over 70% of the nickel content of a solution, whereas NaOH modification improved the adsorption efficiency to over 77% in the same contact time of 60 min. The optimum pH of adsorption was recorded as 5 for the metal using both types of biomass. However, modification improved the adsorption efficiency to a pH lower than 4. The kinetic study conducted showed that the adsorption process follows Lagergren’s pseudo-second order reaction with R2 values equal to 0.9988 and 0.9989 for both types of biomass. The presence of cations such as calcium and magnesium also interfered negatively with the adsorption process. Between 20-35% reductions in the metal adsorbed were recorded in the presence of a 1 M concentration of Mg, Ca or mixed Mg and Ca ions. Langmuir model of adsorption isotherm gave the best fit for this sorption process with R2 values of 0.994, 0.995 and 0.997 for Mg, Ca and mixed Mg and Ca studies, respectively.

Keywords: Adsorption, Adsorption Isotherm, Aqueous Solution, Binding, Biomass, Biosorbent, Biosorption, Cadmium Removal, Calcium, Capacity, Cation, Concentration, Copper Ions, Dependency, Efficiency, Equilibrium, Feasibility, Heavy-Metals, Highway, Investigation, Ions, Isotherm, Kinetic, Kinetic Study, Kinetics, Langmuir, Langmuir Model, Loading, Magnesium, Metal, Model, Modification, NaOH, Nickel, Nigeria, pH, Phytofiltration, Plant, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Rice Bran, Sawdust Adsorption, Solution, Solutions, Sorption, Sorption Process, Tithonia Diversifolia, Uptake, Waste-Water

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Full Text: [2009\Des Wat Tre12, 375.pdf](2009/Des%20Wat%20Tre12,%20375.pdf)

Abstract: The treatment of water polluted with bromate ions using GAC (granular activated carbon) was studied. As bromate ion is not a natural component of water, but it may be formed during the disinfection processes of drinking water, the level of bromate concentration according to WHO regulation in drinking water Must be below 10 mu g/l, and in view of this very low permissible concentration and the practical limitation of bromate available treatment processes, the adsorption of bromate in a GAC bed reactor and the effect of different parameters on the rate of bromate removal such as initial bromate concentration, Solution flow rate, column contact time and temperature were investigated. It was found that the rate of bromate removal is increased by increasing the column contact time and temperature but decreased by increasing initial bromate concentration and solution flow rate. The removal of bromate from water using a granular activated carbon bed reactor was found to be an efficient technique for the removal of bromate ions, as high removal rate LIP to 95% was achieved. The present data suggest the use of flow rates in operating continuous reactors in order to obtain a high degree of bromate removal.

Keywords: Activated Carbon, Adsorption, Bromate, Bromate Removal, Bromide, Carbon, Chlorine, Desalination, Disinfection, Drinking Water, GAC, Granular Activated Carbon, Ion, Ozonation, Regulation, Removal, Temperature, Treatment, Water

? Hegazy, A.K., Kabiel, H.F. and Fawzy, M. (2009), Duckweed as heavy metal accumulator and pollution indicator in industrial wastewater ponds. *Desalination and Water Treatment*, **12** (1-3), 400-406.

Full Text: [2009\Des Wat Tre12, 400.pdf](2009/Des%20Wat%20Tre12,%20400.pdf)

Abstract: Bioaccumulations of the four heavy metals Cr, Cu, Pb and Zn in Lemna gibba (duckweed) as an environmental indicator of contaminated industrial wastewater were detected. Plant pigment content (chlorophyll and carotenoids) were estimated. During the study, heavy metals were ranked according to the preference for bioaccumulation by L. gibba, Zn came in the first place followed by Cr, Pb and Cu with bioaccumulation factors 13.9, 6.3, 5.5 and 2.5 respectively. The chlorophyll and carotenoid content in L. gibba fronds were altered by the bioaccumulation of heavy metals showing a substantial change in colour from green (lowest degree of bioaccumulation) to pale green (high bioaccumulation) and then degreened (maximum bioaccumulation) fronds. As the bioaccumulation of heavy metals increased in fronds, chlorophyll a content decreased, chlorophyll b content increased and the carotenoids became greater than chlorophyll (a + b) content especially in the pale green fronds. Zinc content in fronds showed greater negative correlations with chlorophyll a, chlorophyll b and total chlorophyll followed by Cu, Pb and Cr. Alternatively, Cr and Cu contents were mostly positively correlated with carotenoid content in L. gibba fronds. The accumulation of higher contents of heavy metal content in L. gibba than in wastewater samples indicates its phytoremediation potentialities. The visual change in colour of fronds from green to pale green and the degreening accompanied by the increase in heavy metal pollution nominate the species as heavy metal accumulator and pollution indicator.

Keywords: Accumulation, Arid Regions, Bioaccumulation, Biosorption, Carotenoids, Change, Chlorophyll, Chromium, Copper, Cu, Degreening, Equilibrium, Green, Growth, Heavy Metal, Heavy Metals, Lemna-Gibba, Metal, Metals, Pb, Phaseolus-Vulgaris, Phytoremediation, Pigments, Plants, Pollution, Species, Toxicity, Wastewater, Zinc

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Full Text: [2009\Des Wat Tre12, 407.pdf](2009/Des%20Wat%20Tre12,%20407.pdf)

Abstract: The present Studies provide the purification of drinking water containing phosphate by electrocoagulation process using zinc as the anode and stainless steel as the cathode. The experimental parameters like electrolyte pH, temperature and current density, and so forth, on the removal efficiency of phosphate were carried out. The adsorption capacity was evaluated using both Langmuir and Freundlich isotherm models. The kinetic studies show that the adsorption obeys second-order kinetics. The maximum removal efficiency of 98.8% was achieved at a current density of 0.05 A/dm2, at a pH of 7.0. Thermodynamic parameters were evaluated. Overall adsorption process was endo-thermic and spontaneous. The adsorption of phosphate preferably fitting the Langmuir adsorption isotherm suggests monolayer coverage of adsorbed molecules.

Keywords: Adsorption, Adsorption Capacity, Adsorption Isotherm, Capacity, Coverage, Drinking Water, Efficiency, Electrocoagulation, Endothermic, Experimental, Freundlich, Freundlich Isotherm, Isotherm, Kinetic, Kinetic Studies, Kinetics, Langmuir, Langmuir Adsorption Isotherm, Models, Monolayer, pH, Phosphate, Purification, Removal, Removal Efficiency, Removal of Phosphate, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Temperature, Thermodynamic, Thermodynamic Parameters, Water, Zinc

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Full Text: [2010\Des Wat Tre13, 267.pdf](2010/Des%20Wat%20Tre13,%20267.pdf)

Abstract: The presence of heavy metals in aqueous solutions beyond certain limits creates serious threat to the environment due to their non-degradability and toxicity. So the search for techniques to remove those pollutants is of increasing interest. Liquid membranes have shown great potential in this way, especially in cases where pollutant concentrations are relatively low and other techniques cannot be applied efficiently. A kinetic study of the influence of some operational variables (organic phase volume, emulsifier concentration in the membrane phase and stirring rate) on the transport of cobalt (II) through bulk liquid membrane containing di(2-ethylhexyl) phosphoric acid (D2EHPA), as mobile carrier, in kerosene and protons, as counter ions, in the product phase (H2SO4), is carried out is this paper. The transport kinetic was analysed by means of a kinetic model involving two consecutive irreversible first order reactions. The rate constants of the extraction and stripping reactions were determined for all the experimental conditions studied. Maximum transport fluxes of cobalt (II) through the bulk liquid membrane were also calculated.

Keywords: Adsorption, Aqueous, Aqueous Solutions, Aqueous-Solutions, Bulk Liquid Membranes, Co(II) Ions, Cobalt, Coupled Transport, D2ehpa, Environment, Exchange Resins, First Order, Heavy Metals, Ion-Exchange, Kinetic, Kinetic Model, Kinetic Study, Kinetics, Membrane, Membrane Processes, Membranes, Metals, Model, Nickel, Phosphoric-Acid, Removal, Solutions, Stripping, Techniques, Toxicity, Transport, Water

? Swain, S.K., Padhi, T., Patnaik, T., Patel, R.K., Jha, U. and Dey, R.K. (2010), Kinetics and thermodynamics of fluoride removal using cerium-impregnated chitosan. *Desalination and Water Treatment*, **13** (1-3), 369-381.

Full Text: [2010\Des Wat Tre13, 369.pdf](2010/Des%20Wat%20Tre13,%20369.pdf)

Abstract: The kinetics and thermodynamics of fluoride adsorption on cerium-impregnated chitosan (CIC) have been studied by the sets of experiments at various conditions (initial fluoride concentration, adsorption time and temperature). The characteristic of the adsorbent before and after fluoride adsorption was examined using Fourier transform infrared spectroscopy (FTIR), scanning electron microscope (SEM) and energy dispersive spectrum (EDS) techniques. Adsorption of fluoride was strongly affected by pH. Pseudo-second order kinetic model best described the reaction rate, and the adsorption capacity calculated by using model equation, was consistent with the actual measurement. Isotherms for the adsorption of fluoride on CIC were developed and the equilibrium data fitted well to the Freundlich, Langmuir, Temkin and Dubinin-Raduskevich (D-R) isotherm. The adsorption isotherms were compared for six different error functions i.e., the sum of the squares of errors (SSE), sum of the absolute errors (SAE), the average relative error (ARE), the hybrid fractional error function (HYBRID), the Marquardt’s percent standard deviation (MPSD), and regression coefficient (R-2) to test the adequacy and accuracy of the model equations. Thermodynamic parameters such as enthalpy, entropy and free energy were calculated using Van’t Hoff equations. The thermodynamics of fluoride adsorption on CIC indicates the spontaneous and endothermic nature of adsorption. Reusability of the CIC adsorbent material was tested up to nine consecutive cycles. Quantitative desorption of fluoride from CIC was found to be more than 93% at pH 12. The performance of the adsorbent material was studied with field water samples collected from a fluorosis endemic-region.

Keywords: Accuracy, Activated Alumina, Adequacy, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherms, Aqueous-Solution, Basic Dye, Beads, Capacity, Chitosan, Concentration, Data, Desorption, Drinking-Water, EDS, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Error, Error-Functions, Errors, Experiments, Field, Fluoride, Fluoride Adsorption, Fluoride Removal, Fluorosis, Freundlich, FTIR, Function, Functions, Hybrid, Infrared Spectroscopy, Ion, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Kinetics and Thermodynamics, Langmuir, Measurement, Model, Performance, pH, Pseudo-Second Order, Pseudo-Second Order Kinetic Model, Pseudo-Second-Order, Reaction, Regression, Removal, SEM, Sorption, Spectroscopy, Standard, Techniques, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Time, Waste-Water, Water, Water Samples

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Full Text: [2010\Des Wat Tre13, 382.pdf](2010/Des%20Wat%20Tre13,%20382.pdf)

Abstract: Tannery wastewater treatment using three isolated bacteria has been studied separately and in combination in the present study. The removal of COD, BOD and Chromium were evaluated. The high salt and Cr tolerant bacteria designated as strain-I showed maximum efficiency in COD and Cr removal from the tannery wastewater of Kolkata, India compared to other two strain-II and strain-III. In combination treatment by all three bacteria showed additive effect in waste degradation. From the results it can be said that the bacteria present in the tannery effluents and nearby soil have significant potential in treatment of leather industrial wastewater.

Keywords: Adsorption, Aqueous-Solutions, Bacteria, Biodegradation, Biological Treatment, Biosorption, BOD, Chromium, Chromium Removal, COD, Combined Treatment Process, Degradation, Fenton’s Reagent, Halophiles, Heavy-Metals, Hexavalent Chromium, India, Leather Industrial Wastewater, Reduction, Removal, Soil, Tannery Wastewater, Treatment, Waste, Wastewater, Wastewater Treatment, Wastewaters

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Full Text: [2010\Des Wat Tre13, 418.pdf](2010/Des%20Wat%20Tre13,%20418.pdf)

Abstract: A weakly crystalline titanium tungstate with Ti:W ratio of 1:1.3 has been prepared and evaluated as a novel inorganic ion exchange resin for the separation of some radioactive isotopes. The product was characterized using X-ray diffraction, FTIR-spectra, thermal analysis and finally X-ray fluorescence. The selectivity behavior of the exchanger vas determined for cesium and cobalt ions at concentration range 10-2 to 10-4 M. The distribution coefficients for both ions were also, evaluated at different nitric acid concentrations. The adsorption results obey Freundlich isotherm and the values of adsorption capacity and intensity were computed for both ions. The different thermodynamic parameters, ΔH (4.45, 13.7 kJ/mol), ΔS (46.5, 68.66 J/mol/deg) and ΔG (-9.61, -7.1 kJ/mol) for the adsorption of cesium and cobalt ions have been reported, respectively.

Keywords: Adsorption, Adsorption Capacity, Adsorption Isotherm, Aqueous, Capacity, Cation-Exchanger, Characterization, Cobalt, Column, Cs+, Distribution Coefficients, Equilibrium, Freundlich, Freundlich Isotherm, Intercalation, Ion Exchange, Isotherm, Phosphate, Removal, Separation, Sorption Mechanism, Thermodynamic, Thermodynamic Parameters, Tin(IV), Titanium, Titanium Tungstate, X-Ray Diffraction, Zirconium

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Full Text: [2010\Des Wat Tre14, 21.pdf](2010/Des%20Wat%20Tre14,%2021.pdf)

Abstract: Ion exchange between the sodium ions from zeolite A and calcium ions from solution was studied as a part of planned water cleaning and softening process which combines zeolite ion exchange with constant flux membrane microfiltration. In the process the membrane provides a positive barrier to high concentrations of both natural solids and zeolite, while the added zeolite simultaneously assists in the removal of dissolved compounds such calcium divalent ions. Both the kinetics and the equilibrium were determined by measuring concentrations of Ca2+ ions in the liquid phase during the exchange process. The capacity of the zeolite studied (synthetic zeolite ZP-4A (SILKEM, Kidricevo, Slovenia)) was around 100 mg/g as Ca2+. The ion exchange process was rapid and non-linear. The equilibrium was well described by UNILAN model and the kinetics by Ho-McKey’s model. The specific resistance of zeolite filtration cake which was created on the membrane surface decreased significantly from 5.5×1010 m/kg to 1×1010 m/kg with the increasing amount of calcium ions loaded inside the zeolite particles. Measurements of zeta-potential and the size of zeolite particles have been carried out to examine the reason for the decrease of specific filtration cake resistance. zeta-potential of zeolite particles increased from -60 μV for fresh sodium loaded zeolite to nearly zero for fully calcium loaded particles. The decrease of the particles surface charge resulted in agglomeration into large clusters. The size of the original zeolite particles was in interval from 2 pm to 10 μm while agglomerates were larger than 100 μm. Filtration cake formed from these agglomerates was more permeable and the specific filtration cake resistance decreased.

Keywords: Adsorption, Capacity, Diffusion, Equilibrium, Flux, Hollow Fiber, Ion Exchange, Isotherm, Kinetics, Membrane, Microfiltration, Model, Non-Linear, Particles, Positive, Removal, Sodium, Softening, Surface Charge, Synthetic Zeolite, Water, Zeolite

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Full Text: [2010\Des Wat Tre14, 67.pdf](2010/Des%20Wat%20Tre14,%2067.pdf)

Abstract: It is known that membrane technologies may have a major role to play in the development of environmental-friendly processes, either in gas or liquid separations. In liquid separations, one of the challenging issues is to get membranes with suitable separation properties able also to survive to the exposure of liquid solvents at various temperatures. Aromatic polyimides are known to exhibit a very good stability to a great number of solvents, but their permeability are low because of their rigid carbon skeleton and of their low available free volume; so their uses are mainly limited to gas separations or to filtration processes (MF, UF). To broaden the application area of polyimides in liquid separations, we have prepared and studied the properties of a block ether aromatic copolyimide series where the ether soft block acts both as a selective and a permeable block; we describe attempts to get asymmetric polyetherimide (PEI) membranes having molecular separation properties using various experimental conditions of dry/wet phase inversion. The PEI physical properties and morphologies (SEM) are reported together with their pervaporation properties for water ethanol separation. The PV results showed that rubbery copolyimides can lead to promising asymmetric membranes for liquid liquid separations.

Keywords: Asymmetric Pei Membranes, Carbon, Development, Diffusion, Ethanol, Free-Volume, Gas Separation Membranes, Gas Separations, Lead, Membrane, Membranes, Mixtures, Organics, PEI, Performance, Permeability, Pervaporation, Phase Inversion, Play, Polyimide, Preparation, Rubbery Copolyetherimides, SEM, Separation, Sorption, Vapor, Water

? Polotskaya, G.A., Penkova, A.V., Pientka, Z. and Toikka, A.M. (2010), Polymer membranes modified by fullerene C-60 for pervaporation of organic mixtures. *Desalination and Water Treatment*, **14** (1-3), 83-88.

Full Text: [2010\Des Wat Tre14, 83.pdf](2010/Des%20Wat%20Tre14,%2083.pdf)

Abstract: Modification of polymer properties by incorporation of nanoparticles is a way for the development of advanced membrane materials. New materials based on the compositions polymer fullerene were developed for the use in pervaporation. Two polymers polyphenylene oxide (PPO) and polyphenylene isophtalamide (PA) were modified by fullerene C-60. Their transport properties were studied in pervaporation of two systems: the reacting mixture ethanol acetic acid water ethyl acetate by fullerene-containing PPO membranes and the methanol/cyclohexane mixture with azeotropic point by fullerene-containing PA membranes. The experimental study of sorption-diffusion parameters were carried out in sorption tests to analyze transport properties of the modified membranes as a function of the fullerene content in membranes.

Keywords: Development, Diffusion, Ethanol, Fullerene-Containing Membranes, Gas Separation Membranes, Membrane, Membranes, Modification, Nanoparticles, Oxide), Permeation, Pervaporation, Poly(Phenylene Isophtalamide), Poly(Phenylene Oxide), Polymer, PPO, Selectivity, Sorption, Transport, Water

? Konowal, E., Sulej-Chojnacka, J. and Prochaska, K. (2010), The influence of types of dual modified starches on the enzymatic hydrolysis in the continuous recycle membrane reactor. *Desalination and Water Treatment*, **14** (1-3), 94-100.

Full Text: [2010\Des Wat Tre14, 94.pdf](2010/Des%20Wat%20Tre14,%2094.pdf)

Abstract: The aim of work was to study the influence of the degree of substitution of acetylated oxidized starch (E-1451) on the process of enzymatic hydrolysis in a continuous recycle membrane reactor (CRMR). Three kinds of E-1451 starch preparations with different degrees of carboxyl group substitution (0.04, 0.11 and 0.5%) and with different degrees of acetylation: 0.5% and 2.5% (3%) were examined. The waxy corn modified starch was also investigated. Hydrolyses were performed in the CRMR equipped with an ultrafiltration module containing a ceramic membrane of tubular configuration. The membranes used were characterised by the following parameters: a length of 0.3 m, external diameter of 10 mm, three channels and a molecular weight cut-off of 50, 15 or 8 kDa. During the process the UF module was working in three variants: with a membrane of 15 kDa or a set of two membranes: 50/15 kDa and 15/8 kDa. The hydrolysis process was performed over a period of 150 min at a temperature of 60°C, at the transmembrane pressure of 0.5 MPa and with a 0.3 ml of enzyme preparation BAN 480 L per 1 kg of dry starch. It was stated that the efficiency of the separation process as well as the effectiveness of hydrolysis process was affected by the type of modification and the degree of substitution of starch.

Keywords: Adsorption, Continuous Saccharification, Corn Starch, Derivatives, Effectiveness, Enzymatic Hydrolysis, Hydrocolloids, Hydrolysis, Interfaces, Membrane, Membrane Fouling, Membrane Permeability, Membrane Reactor, Membranes, Performance, Preparation, Separation, Surface-Properties, Temperature, Ultrafiltration

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Full Text: [2010\Des Wat Tre14, 158.pdf](2010/Des%20Wat%20Tre14,%20158.pdf)

Abstract: Sorption and pervaporation properties of homogeneous membranes based on composites containing polyaniline (PANI) and copolymer of aniline with anthranilic acid (coPANI) involved in matrix of aromatic polyimide (PI) were investigated for binary organic mixtures with azeotropic points. It was established that PI membrane exhibited the highest selectivity to methanol during separation of methanol/toluene mixture due to the higher degree of equilibrium sorption and lower Flory-Huggins polymer-solvent interaction parameter with respect to methanol as compared with PI/PANT composites. Addition of coPANI in PI matrix leads to increasing of hydrophilic properties and consequently equilibrium sorption of water during separation of water/isopropanol mixture. PI/coPANI exhibits higher transport properties (flux and selectivity) as compared with that of PI membrane.

Keywords: Aromatic Polyimide, Diffusion, Equilibrium, Flux, Gas Separation, Interaction, Isopropanol Mixtures, Membrane, Membranes, Pervaporation, Polyaniline, Separation, Sorption, Transport, Water

? Beery, M., Lee, J.J., Kim, J.H. and Repke, J.U. (2010), Ripening of granular media filters for pretreatment of seawater in membrane desalination. *Desalination and Water Treatment*, **15** (1-3), 29-34.

Full Text: [2010\Des Wat Tre15, 29.pdf](2010/Des%20Wat%20Tre15,%2029.pdf)

Abstract: The successful operation of a seawater reverse osmosis desalination plant depends greatly on the performance of the pretreatment step. The start-up of a pretreatment filtration process usually begins with a dynamic part called ripening, during which the filter media increases its adsorption ability and improves the removal of foulants from the seawater. In that period (typically lasting 30-60 min, depending on the system’s conditions) the effluent often does not meet the quality requirements of the RO membranes and must often be disposed of. An observation and analysis of the ripening phenomena was performed using lab scale acrylic filter columns containing granular activated carbon. The seawater originated from the Yellow Sea in Korea and an inline coagulation was performed prior to filtration using an optimal dose of FeCl3 based on a jar test. The turbidity, total suspended solids concentration and dissolved organic carbon were measured before and after filtration with the goal of assessing the filtration performance. The filter media, which was cleaned and dried before filtration showed distinct ripening characteristics. The measurements were then used for parameter identification of a typical filtration model. Based on the fitted model one can predict the optimal filter depth that would reduce the waste stream production of the plant.

Keywords: Activated Carbon, Adsorption, Carbon, Characteristics, Coagulation, Desalination, Effluent, Granular Activated Carbon, Identification, Korea, Media Filtration, Membrane, Membranes, Model, Pretreatment, Removal, Reverse Osmosis, Ripening, Scale, Waste

? Nabi, S.A., Ganai, S.A. and Naushad, M. (2010), Preparation and characterization of a new inorganic cation-exchanger: Zirconium(IV) iodosilicate: Analytical applications for metal content determination in pharmaceutical sample and synthetic mixture. *Desalination and Water Treatment*, **16** (1-3), 29-38.

Full Text: [2010\Des Wat Tre16, 29.pdf](2010/Des%20Wat%20Tre16,%2029.pdf)

Abstract: A new inorganic cation exchanger zirconium(IV) iodosilicate was synthesized and characterized on the basis of X-ray, TGA-DTA, FTIR and SEM studies. This cation-exchanger was found to have a good ion-exchange capacity (0.85 meq g-1 for Na+), high thermal and chemical stability. The chemical composition reveals that Zr:I:Si is in the molar ratio 1:1.57: 1. The chemical stability data shows that material is quite stable in common mineral acids, bases and organic solvents of analytical interest upto 2.0 M. Thermal analysis shows that exchanger retain 80% of ion-exchange capacity upto 400°C. Effect of time and temperature on the sorption of metal ions on this material was explored. The sorption behavior of metal ions was studied in acetic acid, formic acid, DMSO, DMF and succinic acid. Some important and analytically difficult quantitative binary separations viz. Cd(II)-Ba(II), Cd(II)-Ni(II), Cd(II)-Cu(II), Cd(II)-Fe(III) etc. were achieved. The practical applicability of the cation-exchanger was demonstrated in the separation of Zn(II)-Fe(III) from a synthetic mixture as well as from real sample of pharmaceutical formulation.

Keywords: Analytical Application, Applications, Aqueous-Solutions, Bagasse Fly-Ash, Biomass Oedogonium sp, Biosorption, Capacity, Characterization, Composition, Equilibrium, FTIR, Inorganic Ion-Exchanger, Ion Exchange, Lead, Low-Cost Adsorbent, Metal, Metal Ions, Pharmaceutical, Pharmaceutical Formulation, Quantitative, Red Mud, Removal, SEM, Separation, Sorption, Sugar-Industry Waste, Synthesis, Temperature, Zirconium(IV) Iodosilicate

? Mouni, L., Merabet, D., Bouzaza, A. and Belkhiri, L. (2010), Removal of Pb2+ and Zn2+ from the aqueous solutions by activated carbon prepared from Dates stone. *Desalination and Water Treatment*, **16** (1-3), 66-73.

Full Text: [2010\Des Wat Tre16, 66.pdf](2010/Des%20Wat%20Tre16,%2066.pdf)

Abstract: The low-cost activated carbon prepared from Date stone, an agricultural solid waste by-product, were prepared by chemical activation with sulphuric acid for the removal of lead and zinc from aqueous solutions has been studied as a function of pH, contact time, metal concentrations and adsorbent concentrations. Adsorption equilibrium was reached after an equilibration time of 60 min and adsorption kinetics data were tested using Lagergren pseudo-first-order and pseudo-second order, the studies showed the adsorption process followed pseudo-second-order rate model. The maximum removal of Pb2+ and Zn2+ is observed at pH 6.0 (94.4%) and 7.0 (93.2%) respectively at initial concentration 20 mg/L. The isotherm equilibrium data were well fitted by the Langmuir and Freundlich models. The adsorption capacity (*q*max) calculated from the Langmuir isotherm was 19.64 mg Pb2+/g and 10.41 mg Zn2+/g at an initial pH of 6.0 at 20±2ºC.

Keywords: Activated Carbon, Activation, Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Adsorption Kinetics, Agricultural, Agricultural Solid Waste, Aqueous Solutions, Biosorption, Cadmium, Capacity, Carbon, Chemical, Chemical Activation, Concentration, Copper, Data, Date Stone, Equilibration, Equilibrium, Fly-Ash, Freundlich, Function, Heavy-Metal Ions, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Lead, Lead and Zinc Removal, Lead Ions, Low Cost, Metal, Model, Models, Pb2+, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Removal, Sawdust, Solid Waste, Solutions, Sorption, Sulphuric Acid, Time, Waste, Waste-Water, Zinc, Zn2+

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Full Text: [2010\Des Wat Tre16, 74.pdf](2010/Des%20Wat%20Tre16,%2074.pdf)

Abstract: Natural aragonite, NA, (in the form of crushed seashells) has a limited capability to remove Cu(II) from an aqueous solution at ambient temperatures (removal = 22.5% at 25ºC). At higher temperature, removal increases (removal = 83.5% at 50ºC). Ion exchange is proposed as the mechanism of removal in this case. However, the treatment of NA by 4% NaOH- solution produced Na-modified aragonite, NA-Na, which has higher capability for Cu(II) removal at ambient temperatures (removal = 76% at 25ºC). This is practically preferred. X ray fluorescence of Na-modified aragonite showed presence of Na element on its surface with about 1% which suggests inclusion of Na in the NA lattice structure and this is in agreement with the results of the X ray diffraction measurements. It is suggested that the modification occurs due to the replacement of some calcium ions by sodium ions over the outer layers of NA lattice, (i.e. facial and subfacial isomorphous-substitution). This substitution causes deficiency in positive charge which is compensated facially by Ca++OH- moieties. It is believed that these moieties are responsible for the micro-precipitation of Cu(II) upon removal process. Cu(II) removal by batch method (at pH value of 6.5) was carried out to assess NA-Na removing performance in terms of capacity (the Langmuir and Freundlich isotherm models) and rate (the pseudo-first and second order models). The Langmuir model gives Cu-Adsorption capacity of 108.7 mg/g at 25ºC. For kinetic study, the pseudo-second-order model is the one that best represents the Cu(II) removal by NA-Na. This suggests that removal is one-step chemisorption, reversible and initial concentration-dependent process.

Keywords: Adsorption, Aqueous Solution, Aragonite, Batch, Batch Method, Beads, Calcium, Capacity, Charge, Chemisorption, Cu(II), Cu(II) Removal, Fluorescence, Freundlich, Freundlich Isotherm, Ion Exchange, Ion-Exchange, Ion-Substitution, Ions, Isotherm, Kinetic, Kinetic Study, Kinetics, Langmuir, Langmuir Model, Mechanism, Micro-Precipitation, Model, Models, Modification, NaOH, Performance, pH, pH Value, Pseudo Second Order, Pseudo-First And, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Second Order, Second-Order, Sodium, Solution, Sorption, Structure, Substitution, Surface, Temperature, Treatment, Value, Waste, X-Ray

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Full Text: [2010\Des Wat Tre16, 83.pdf](2010/Des%20Wat%20Tre16,%2083.pdf)

Abstract: The use of Scrap Tyre (ST) for the sorption of Cu(II) ion from aqueous solution has been studied in a batch experiment. Investigation includes the effect of initial Cu(II) ion concentration and agitation speed. Three kinetic models (Pseudo first order, pseudo second order and Elovich kinetic models), were employed to predict the overall rate constant of sorption, the equilibrium sorption capacity and the initial sorption rate. The equilibrium sorption of Cu(II) ion by ST was analysed using Langmuir, Freundlich and Temkin isotherm models. The monolayer sorption capacity (mg/g) of ST for Cu(II) ion was 34.84. Thermodynamic parameters were calculated and the sorption process was found to be spontaneous and exothermic. The use of ST as a sorbent in Cu(II) ion attenuation in wastewater shall help to reduce the cost of treating Cu(II) ion bearing wastewater and to curtail the negative environmental impact of ST as a solid waste.

Keywords: Activated Carbon, Adsorption, Adsorptions, Agitation, Aqueous Solution, Batch, Biosorption, Capacity, Concentration, Copper Ion, Cost, Cu, Elovich, Environmental, Environmental Impact, Equilibrium, Exothermic, Experiment, First, First Order, Freundlich, Impact, Intraparticle, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Lead, Liquid Film, Mass Transfer, Models, Monolayer, Peat, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Constant, Removal, Scrap Tyre, Second Order, Second-Order, Solid Waste, Solution, Sorbent, Sorption, Sorption Capacity, Sorption Process, Temkin, Temkin Isotherm, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Tyre, Waste, Waste-Water, Wastewater

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Full Text: [2010\Des Wat Tre16, 120.pdf](2010/Des%20Wat%20Tre16,%20120.pdf)

Abstract: PAC/UF was investigated for removing M. aeruginosa cells and microcystins from natural waters and its performance was compared with the conventional clarification with PAC addition (PAC+C/F/S). Ozonated and clarified waters from Tavira’s Water Treatment Plant were used. Both processes achieved an absolute removal of chlorophyll-a, but greater turbidity and microcystins (intra and extracellular) removals were reached by PAC/UF. With PAC/UF, 10 mg/L PAC resulted in a cycle-averaged concentration of microcystins in the permeate (0.72 mu g/L MC-LReq) below the WHO guideline value, while the water quality obtained with 15 mg/L PAC+C/F/S was far beyond that guideline value. However, the occurrence of cell lysis during UF (with subsequent release of microcystins and UV254nm absorbing substances) and the preferential removal of high molar mass compounds by coagulation yielded better UV254nm removals by PAC+C/F/S. Natural organic matter showed a small impact onto microcystins removal, with greater effect of some algogenic compounds, but especially of high concentrations of humic and tannic-like compounds.

Keywords: Adsorption, Aeruginosa, Air Flotation, Aom, Clarification, Coagulation, Cyanobacterial Cells, Dissolved Organic-Matter, Impact, Membrane, Microcystins, Molecular-Weight, Natural Organic Matter, NOM, Occurrence, PAC, PAC, UF, Powdered Activated Carbon, Removal, Ultrafiltration, Water, Water Quality

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Full Text: [2010\Des Wat Tre16, 129.pdf](2010/Des%20Wat%20Tre16,%20129.pdf)

Abstract: This paper reports the efficiency of dunite as an alternative alkalinity generating material and adsorbent for the passive treatment of acid mine drainage (AMD). The acid neutralization capacity (ANC) of dunite has been investigated by contacting dunite (powder) samples with laboratory (acidic) solution and AMD samples and it has been shown that the ANC of dunite is 1 mmol/g dunite and is basically ascribed to the MgO content of the rock material. On the other hand contacting 1 g/l and 10 g/l dunite with AMD samples, results in increasing pH and significant removal of various metal ions (e.g. Cr(III), Co(II), Ni(xII), Ph(II)) contained in AMD. The latter is basically attributed to the precipitation of metal ions due to the pH increase in the AMD solutions.

Keywords: Acid, Acid Mine Drainage, Acid-Base Properties, Adsorbent, Adsorption, Amd, Capacity, Cr(III), Drainage, Dunite, Heavy Metals, Limestone, Metal, Metal Ions, Metals, MgO, Passive Treatment, pH, Precipitation, Removal, Removal, Solutions, Treatment

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Full Text: [2010\Des Wat Tre16, 146.pdf](2010/Des%20Wat%20Tre16,%20146.pdf)

Abstract: The aim of this study was to explain the influence of chemical conditions on the ion exchange capacity and the kinetics of heavy metal ions i.e. copper(II), cobalt(II) nickel(II), cadmium(II), lead(II) and iron(III) in the presence of complexing agents of a new generation. For investigations the following complexing agents were selected: sodium salt of N-(1,2-dicarboxyethyl)-D,L-aspartic acid, which has the commercial name Baypure CX 100 (IDS), glutamic diacetic acid (GLDA) also known as Dissolvine GL-38 and N,N’-ethylenediaminedisuccinic acid (EDDS) known as Enviomet (TM) C140. In the studies an anion exchange was applied which is a method used in water treatment and wastewater purification. This method is suitable for removal of all contaminants in the ionic form including heavy metal ions in the presence of complexing agents from different systems. The results obtained under different experimental conditions will be presented and discussed in this paper.

Keywords: Anion Exchange, Aquatic Environment, Aqueous-Solution, Biodegradable Complexing Agents, Cadmium(II), Capacity, Cobalt(II), Complexing Agents, Contaminants, Copper(II), EDDS, Heavy Metal, Heavy Metal Ions, Iminodisuccinic Acid, Ion Exchange, Ion Exchangers, Kinetics, Lead(II), Metal, Metal Ions, Monodisperse Anion-Exchangers, Recovery, Removal, Sodium, Sorption, Speciation, Stability, Treatment, Wastewater, Wastewaters, Water, Water Treatment

? Cheng, R.M., Ou, S.J., Xiang, B., Li, Y.J., Chang, F. and Li, M.J. (2010), Acyclic polyamine modified starch for amido black 10B removal in basic solution. *Desalination and Water Treatment*, **16** (1-3), 176-181.

Full Text: [2010\Des Wat Tre16, 176.pdf](2010/Des%20Wat%20Tre16,%20176.pdf)

Abstract: Four acyclic polyamine modified starches, CAS1, CAS2, CAS3 and CAS4 were synthesized by using ethylenediamine, diethylenetriamine, triethylenetetramine and tetraethylenepentamine, respectively. Their interactions with amido black 10B in aqueous solution at pH value of 10 were investigated. It was found that the adsorption was predominantly governed by hydrogen bonding. The removal process of AB10B increased smoothly and followed the pseudo-second-order equation. The Langmuir isotherm gave satisfying fits to equilibrium data and the capacities followed the order CAS2 > CAS1 > CAS3 > CAS4. The thermogravimetric analyses indicated the fact that the interaction of CAS2 with amido black 10B was strongest, bringing on the highest adsorption capacity. In the presence of NaCl, the capacties increased slightly.

Keywords: Acylic Polyamine, Adsorbents, Adsorption, Adsorption, Adsorption Capacity, Amido Black 10b, Analyses, Aqueous Solution, Aqueous-Solutions, Capacity, Data, Degradation, Dyes, Effluent Treatment, Equilibrium, Ethylenediamine, Hydrogen, Hydrogen Bonding, Interaction, Isotherm, Langmuir, Langmuir Isotherm, Modifed Starch, Modified, NaCl, pH, pH Value, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Removal, Sludge, Solution, Starch, Thermogravimetry, Value, Waste-Water

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Full Text: [2010\Des Wat Tre16, 262.pdf](2010/Des%20Wat%20Tre16,%20262.pdf)

Abstract: The isotherms, kinetics and thermodynamics of Pb(II) ions from aqueous solution by activated carbon prepared from Bombax ceiba sawdust (SDC) were carried out in a batch adsorption system. The effects of pH, adsorbent dosage, contact time, initial concentration of Pb(II) and temperature on the adsorption were studied. Maximum adsorption of Pb(II) occurred at pH 5. Pseudo first order, pseudo second order and intraparticle diffusion models were applied to kinetic data. The sorptive mechanism followed the pseudo second-order kinetics and intra particle diffusion model. The equilibration data fitted well with both Langmuir and Freundlich isotherm model with maximum sorption capacity of 209 mg g(-1). The mean free energy of adsorption calculated from Dubinin-Radushkevich (D-R) isotherm model indicated that the adsorption of metal ions was found to be by chemical ion exchange. Thermodynamic parameters and Tempkin constant showed that the sorption process of Ph(II) onto SDC was feasible, spontaneous and endothermic under studied conditions.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Behavior, Agricultural Waste, Aqueous Solution, Aqueous Solutions, Batch, Batch Adsorption, Biosorption, Capacity, Carbon, Chemical, Concentration, Data, Diffusion, Diffusion Model, Dust, Endothermic, Energy, Equilibration, Equilibrium, First, First Order, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Heavy-Metals, Intraparticle Diffusion, Ion Exchange, Ion-Exchange, Ions, Isotherm, Isotherm Model, Isotherms, Kinetic, Kinetics, Kinetics, Kinetics and Thermodynamics, Langmuir, Lead, Mechanism, Metal, Metal Ions, Model, Models, Particle Diffusion, Particle Diffusion Model, Pb(II), Pb(II) Ions, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Rice Husk Ash, Saw Dust, Saw Dust Carbon, Sawdust, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Seed Powder, Solution, Solutions, Sorption, Sorption Capacity, Sorption Process, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Time

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Full Text: [2010\Des Wat Tre16, 271.pdf](2010/Des%20Wat%20Tre16,%20271.pdf)

Abstract: The objective of this work is to investigate the possibility of using a low cost and naturally available apatite rich adsorbents from animal bones such as bovine bone (BV) and billy goat (BC) bones for the removal of zinc(II) from aqueous solutions. The adsorption studies were compared with synthetic hydroxyapatite (HAPs). The samples were characterized by thermogravimetry (TG), Fourier transform infrared spectroscopy (IR) and X-ray diffraction (XRD). The equilibrium isotherm data were fitted to the Langmuir, Freundlich, Temkin, Elovich and Dubinin-Redushkevich isotherm equations to obtain the characteristic parameters of each model. The adsorption of Zn(II) on BV and BC fitted well with the Langmuir isotherm where as HAPs fitted well with Dubinin Raduskevich isotherm model. The kinetic studies showed that the sorption rates could be described well by a pseudo-second-order kinetic model. Also it was shown that the adsorption of Zn(II) could be fitted to the intraparticle mass-transfer model. The studies showed that BC, BV and HAPs can be used as an efficient adsorbent material for the treatment of Zn(II) from water and wastewater. The order of the removal capacity for these adsorbents was determined as HAPs (93%) > BC (90%) > BV (82%).

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption, Animal Bones, Animal Bones, Apatite, Aqueous Solutions, Aqueous-Solutions, Bagasse Fly-Ash, Bone, Bovine, Capacity, Chromium, Cost, Data, Elovich, Equilibrium, Equilibrium Isotherm, Freundlich, Goat, Hydroxyapatite, Infrared Spectroscopy, Ir, Isotherm, Isotherm Equations, Isotherm Model, Isotherms, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Langmuir Isotherm, Lead, Low Cost, Low-Cost Adsorbent, Mass Transfer, Model, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Rates, Removal, Solutions, Sorption, Spectroscopy, Sugar-Industry Waste, Temkin, Thermogravimetry, Treatment, Wastewater, Water, Work, X-Ray, X-Ray Diffraction, XRD, Zinc(II), Zn(II)

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Full Text: [2010\Des Wat Tre16, 282.pdf](2010/Des%20Wat%20Tre16,%20282.pdf)

Abstract: Studies on a batch sorption process using activated carbon derived from walnut shell were investigated to remove Ni(II) ions from aqueous solutions. The influence of operational conditions such as contact time (0-150 min), solution initial pH (2-8), Ni(II) initial concentration (10-80 mg/L), sorbent mass (0.05-1.0 g/100 mL) and temperature (293-313 K) on the sorption was studied. Sorption data of Ni(II) ions onto walnut shell carbon (WSC) obeys the Langmuir isotherm model. Maximum sorption capacity of sorbent was 15.34 mg/g at 303 K. The kinetic data was fitted to pseudo-first-order model and pseudo-second-order model for different initial concentration to evaluate the model parameters. Pseudo-second-order model is better to represent the sorption process. Values of ΔG° ranging from -1.58 to -3.47 kJ/mol suggest that the sorption process is spontaneous and mainly governed by specific surface interaction mechanism. The values of ΔH° and ΔS° were 26.35 kJ/mol and 0.095 kJ/mol K, respectively. Results of this study will be useful for future scale up for using this waste material as a low-cost sorbent for the removal of Ni(II) ions from wastewater.

Keywords: Activated Carbon, Adsorption, Aqueous Solutions, Batch, Capacity, Carbon, Concentration, Copper, Data, Equilibrium, Heavy-Metals, Interaction, Ions, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Low Cost, Mechanism, Model, Ni(II), Ni(II) Ions, Nickel, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Scale, Solution, Solutions, Sorbent, Sorption, Sorption Capacity, Sorption Process, Specific Surface, Surface, Surface Interaction, Temperature, Time, Waste, Wastewater

? Jarrah, N.A. (2010), Adsorption of Cu(II) and Pb(II) from aqueous solution using Jordanian natural zeolite based on factorial design methodology. *Desalination and Water Treatment*, **16** (1-3), 320-328.

Full Text: [2010\Des Wat Tre16, 320.pdf](2010/Des%20Wat%20Tre16,%20320.pdf)

Abstract: Parametric study was conducted to study the adsorption of Cu(II) and Pb(II) from aqueous solution using Jordanian Natural Zeolite (JNZ) as an adsorbent. Two levels factorial design was implemented to determine the main and interaction effects of initial metal ion concentration (20-100 mg/L), pH (2-4), and temperature (20-50°C) on the ion uptake as a response variable. The effect of initial ion concentration was found the most prominent impact in increasing the ion uptakes (t = 352.86, p = 0.00 for Cu(II) and t = 1538.2, p = 0.00 for Pb(H)). Initial pH value was found to have a slight positive effect on the ion uptake (t = 13.35, p = 0.006 for Cu(II) and t = 9.49, p = 0.011 for Pb(II)). Overall, the effects of some interactions among the studied parameters were significant on ion uptakes. The highest uptakes obtained were 65 and 122.13 mg/g JNZ for Cu(II) and Pb(H), respectively. Both Langmuir and Freundlich isotherms were found to be appropriately fitting the adsorption data. Factorial design was a powerful method, which revealed the main and interaction effects and their relative magnitudes. The revealed insights will help in searching for a global optimum adsorption conditions.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous, Basic Dye Removal, Clinoptilolite, Cross-Linked Chitosan, Cu(II), Equilibrium, Factorial Design, Fixed-Bed, Freundlich, Freundlich Isotherms, Global, Heavy-Metals Uptake, Impact, Interaction, Ion-Exchange, Isotherms, Langmuir, Langmuir and Freundlich Isotherms, Metal, Metal Ion, Methodology, Natural Zeolite, Pb(II), Pb2+, pH, Positive, Sorption Isotherms, T, Temperature, Tuff, Zeolite

? Rouibah, K., Meniai, A.H., Rouibah, M.T., Deffous, L. and Lehocine, M.B. (2010), Chromium VI and cadmium II removal from aqueous solutions by olive stones. *Desalination and Water Treatment*, **16** (1-3), 393-401.

Full Text: [2010\Des Wat Tre16, 393.pdf](2010/Des%20Wat%20Tre16,%20393.pdf)

Abstract: The present work reports a study on the test of olive stones as an adsorbent for removal of cation Cd(II) and the oxyanion Cr(VI) from aqueous solutions. The experimental elimination of the species has been carried out batchwise and the influence of certain physico-chemical parameters such as the contact time, the pH of the solution, the temperature, the solid to liquid ratio and the agitation speed has also been considered. The equilibrium adsorption capacity of the olive stones for the case of Cr(VI) follows the Langmuir model, whereas for the Cd(II) cations, the two models - Langmuir and Freundlich can be equally representative. The adsorption process has been found to be of pseudo second-order and the rate constants have been determined for both cations. The Gibbs free energy sign is negative for the adsorption of both cations, indicating that the process is spontaneous. Finally the olive stones retain chromium more than cadmium, but at optimal conditions, high removal percentages are reached for both cations.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Agitation, Aqueous Solutions, Cadmium, Capacity, Cation, Cd(II), Chromium, Cr(VI), Energy, Equilibrium, Experimental, Freundlich, Gibbs Free Energy, Heavy-Metal Ions, Industrial-Waste-Water, Isotherm, Langmuir, Langmuir Model, Lead, Liquid, Model, Models, Olive Stones, Pb(II), pH, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Rate Constants, Removal, Retention, Second Order, Second-Order, Solution, Solutions, Sorption, Species, Temperature, Time, VI, Work

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Full Text: [2010\Des Wat Tre17, 113.pdf](2010/Des%20Wat%20Tre17,%20113.pdf)

Abstract: Mixed matrix scaffolds were synthesized by uniformly distribution of ion exchange resins (H+ form Amberjet, ID 780 mu m) into the stereo-structural chitosan matrix and then used for the removal of copper ions from waste water. Specifically, Amberjet particles suspended in a 1 wt% of viscous chitosan solution were filled with cylindrical aluminum containers to prepare chitosan mixed matrix scaffolds through the freeze-gelation process. The internal surface area of mixed matrix scaffolds is 78 m2/g. The adsorption processes were performed by chelate copper ions of waste water onto the amine functional groups (-NH2) exposure on the external and porous stereo-structural surfaces of chitosan matrix as well as the sulfonate functional groups on the outer surface of ion exchange resins, respectively. Results of a low initial copper ion concentration of 5 mg Cu2+/L were used to study the adsorption capacities as well as adsorption kinetics experimentally. The kinetic experimental data correlated well with the second order adsorption model, suggesting that the rate limiting step of mixed matrix scaffolds may be the chemical adsorption.

Keywords: Adsorbent, Adsorption, Adsorption Kinetics, Chitosan, Copper, Cu(II), Kinetic, Kinetics, Linked Chitosan Beads, Low, Membranes, Mixed Matrix Scaffolds, Separation, Sorption, Synthesis

? Franca, A.S., Oliveira, L.S., Saldanha, S.A., Santos, P.I.A. and Salum, S.S. (2010), Malachite green adsorption by mango (*Mangifera indica* L.) seed husks: Kinetic, equilibrium and thermodynamic studies. *Desalination and Water Treatment*, **19** (1-3), 241-248.

Full Text: [2010\Des Wat Tre19, 241.pdf](2010/Des%20Wat%20Tre19,%20241.pdf)

Abstract: Mango seed husks (MSH), an agricultural waste, was evaluated as an adsorbent for removal of malachite green (MG) from aqueous solutions Batch adsorption tests were performed at room temperature and the effects of contact time and initial solution pH were investigated Equilibrium was attained after 2 h for all the tested initial MG concentrations (100-500 mg L-1) Adsorption kinetics was determined by fitting pseudo first and second-order kinetic models to the experimental data, with the pseudo second-order model providing the best description of MG adsorption by MSH. The experimental adsorption equilibrium data were fitted to Langmuir and Freundlich adsorption models, with Freundlich providing the best fit Evaluation of thermodynamics parameters indicated that the adsorption is spontaneous (ΔGº = -4190 J mol-1 at 30ºC) and exothermic (ΔHº = -66 2 KJ mol-1) Maximum adsorption capacity was 47 9 mg g-1, comparable to other untreated agricultural residues such as rattan sawdust and lemon peel. The experimental data obtained in the present study indicate that this type of waste material is a suitable candidate for use as a biosorbent in the removal of cationic dyes.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Adsorption Kinetics, Agri-Food Waste, Toxic Pollutants, Agricultural, Agricultural Waste, Aqueous Solutions, Aqueous-Solutions, Batch Adsorption, Biosorbent, Biosorption, Capacity, Cationic Dyes, Data, Dye, Dyes, Equilibrium, Exothermic, Experimental, First, Freundlich, Isotherm, Kinetic, Kinetic Models, Kinetics, L1, Langmuir, Malachite Green, Mg, Model, Models, pH, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Rattan Sawdust, Removal, Room Temperature, Sawdust, Second Order, Second-Order, Second-Order Model, Solution, Solutions, Sorption, Temperature, Thermodynamic, Thermodynamic Studies, Thermodynamics, Waste, Waste-Water

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Full Text: [2010\Des Wat Tre19, 255.pdf](2010/Des%20Wat%20Tre19,%20255.pdf)

Abstract: Water scarcity and pollution rank equal to climate change as the most intricate environmental turmoil for the 21st century Today, the percolation of textile effluents into the waterways and ecosystems remain a fastidious conundrum towards the public health and food chain interference In such circumstances, it becomes mandatory for each dye emitting industry or facility to opt for proper dye control measures With the renaissance of activated carbon, there has been a steadily growing interest in this research field This paper attempts to postulate a state of the art review of dye processing industry, its fundamental characteristics and environmental implications. Moreover, the key advance of proposed precursors, activated agents, together with the effects of adsorbent dosage, concentration, contact time, pH, particle size, temperature competition, and isotherms, kinetic and thermodynamic studies for adsorption of dyes onto activated carbons are summarized and discussed. Conclusively, the expanding of adsorption science in dye treatment represents a plausible tool for accruing the worldwide environmental benefit and shaping the national economy.

Keywords: Acid Brilliant Blue, Activated Carbon, Activated Carbon Adsorption, Activated Carbon,Adsorption, Activated Carbons, Adsorbent, Adsorbent Dosage, Adsorption, Advance, Aqueous-Solution, Art, Basic Dye, Carbon, Characteristics, Climate, Climate Change, Competition, Concentration, Control, Dye, Dye Removal, Dyes, Economy, Ecosystems, Effluents, Environmental, Equilibrium Isotherm Analyses, Field, Food, Health, Isotherm, Isotherms, Kinetic, Kinetics,Thermodynamics, Liquid-Phase Adsorption, Mandatory, Methylene-Blue Adsorption, Particle Size, pH, Pollution, Pore-Size Distribution, Public, Public Health, Rank, Removal, Research, Review, Sawdust Hevea-brasiliensis, Science, Size, State, Surface Chemical Characteristics, Temperature, Textile Effluents, Textile Waste-Water, Thermodynamic, Thermodynamic Studies, Treatment, Water

? Ong, S.T., Khoo, E.C., Hii, S.L. and Ha, S.T. (2010), Utilization of sugarcane bagasse for removal of basic dyes from aqueous environment in single and binary systems. *Desalination and Water Treatment*, **20** (1-3), 86-95.

Full Text: [2010\Des Wat Tre20, 86.pdf](2010/Des%20Wat%20Tre20,%2086.pdf)

Abstract: In the present study a biodegradable and low cost sorbent was investigated for its sorptive capacity for various basic dyes in both single and binary dye solutions. As wastewaters from textile industries may contain a variety of dyes, therefore, it is of great interest to have a sorbent capable of removing dyes either singly or simultaneously. The agricultural by-product has shown its potential to remove Basic Blue 3 (BB3), Methylene Blue (MB) and Basic Yellow 11 (BY11) in both single and binary systems. The effect of pH, contact time and initial concentration, dosage and particle size was studied in batch experiments at room temperature. The optimum pH for the removal of studied dyes was observed in the pH range 4-9 and the sorption reached equilibrium at 60 min. The optimum sorbent dosage was recorded at 0.10 g. The sorption process fitted well in the pseudo-second order kinetic model and Langmuir isotherm was applicable for all the dye systems studied. Maximum sorption capacities were 23.64 mg g-1, 28.25 mg g-1 and 67.11 mg g-1 for BB3, MB and BY11, respectively, in single dye system. However, a decrease in the maximum sorption capacity was observed in the binary systems and this might be resulted from the competition of the same binding sites.

Keywords: Acid Dyes, Adsorption, Agricultural, Agricultural By-Product, Bagasse, Basic Blue 3, Basic Dyes, Batch, Batch Experiments, Binding, Binding Sites, Biosorption, Capacity, Competition, Concentration, Cost, Dye, Dyes, Environment, Equilibrium, Experiments, Husk, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Low Cost, Low Cost Sorbent, Low-Cost Adsorbent, Mb, Methylene Blue, Methylene-Blue, Model, Modified Rice Hull, Orange Peel, Particle Size, pH, Potential, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Room Temperature, Size, Solutions, Sorbent, Sorption, Sorption, Sorption Capacity, Sorption Process, Sugarcane, Sugarcane Bagasse, Systems, Temperature, Waste-Water, Wastewaters

? Abd El-Latif, M.M. and Ibrahim, A.M. (2010), Removal of reactive dye from aqueous solutions by adsorption onto activated carbons prepared from oak sawdust. *Desalination and Water Treatment*, **20** (1-3), 102-113.

Full Text: [2010\Des Wat Tre20, 102.pdf](2010/Des%20Wat%20Tre20,%20102.pdf)

Abstract: Activated carbons prepared from oak sawdust, a timber industry waste, have been examined for the removal of remazol brilliant blue (RB) dye from aqueous solutions through batch adsorption technique. Activated carbons were prepared from oak sawdust by chemical activation with 10% HNO3 (AC1) followed by pyrolysis at 500ºC in the absence of air and by physical activation at 500 degrees C in the absence of air (AC2). Activated carbons were characterized by SEM, BET and FTIR. Also pH(pzc) was followed by pyrolysis at 500ºC in the absence of air and by physical activation at 500ºC in the absence of air for both activated carbons was determined. The effect of pH, adsorbent dose, agitation speed, contact time and initial dye concentration on remazol blue (RB) adsorption were studied. Equilibrium data were fitted to Langmuir, Freundlich and Temkin isotherm models. The equilibrium data were best represented by the Langmuir isotherm model. The kinetic data were fitted to pseudo-first-order, pseudo-second-order, Elovich and intraparticle diffusion models, and it was found to follow closely the pseudo-second-order model.

Keywords: Acid Dye, Activated Carbon, Activated Carbons, Activation, Adsorbent, Adsorbent Dose, Adsorption, Agitation, Agricultural Solid-Waste, Air, Aqueous Solutions, Azo Dyes, Batch, Batch Adsorption, BET, Chemical, Chemical Activation, Coir Pith, Concentration, Copper Ions, Data, Diffusion, Dye, Elovich, Equilibrium, Freundlich, FTIR, Intraparticle Diffusion, Isotherm, Isotherm Model, Isotherm Models, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Linked Chitosan Beads, Methylene-Blue, Model, Models, pH, pH(pzc), Physical, Physical Activation, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Pyrolysis, Reactive Dye, Removal, Sawdust, SEM, Solutions, Sorption, Surface-Chemistry, Temkin, Temkin Isotherm, Textile Effluent, Waste

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Full Text: [2010\Des Wat Tre20, 114.pdf](2010/Des%20Wat%20Tre20,%20114.pdf) ???

Abstract: This paper presents the adsorption of Cu(II) from aqueous solution by raw sepiolite (RS), manganese oxide-coated sepiolite (MCS), and base activated sepiolite (BAS) samples. Adsorption of Cu(II) by sepiolite samples was investigated as a function of the initial Cu(II) concentration, solution pH, ionic strength, temperature and the presence of an inorganic ligand (Cl-). Changes in the surface and structure were characterized by means of XRD, IR and N-2 gas adsorption data. The Langmuir monolayer adsorption capacities of RS, MCS and BAS in 0.1 M KNO3 solution were calculated to be 5.55, 6.70 and 13.46 mg/g, respectively. Delta G, Delta H and Delta S were determined as -18.94 kJ/mol (at 303 K), 25 kJ/mol and 145 J/mol K, -19.51 kJ/mol (at 303 K), 2 kJ/mol and 71 J/mol K and -20.51 kJ/mol (at 303 K), 31 kJ/mol and 170 J/mol K for RS, MCS, and BAS, respectively.

Keywords: Adsorption, Adsorption Capacities, Aqueous Solution, Aqueous-Solution, Basic Dye, Clay, Concentration, Copper, Copper Ions, Cu(II), Data, Dye Adsorption, Fly-Ash, Function, Ionic Strength, Ions, IR, Langmuir, Lead Ions, Ligand, Manganese, Manganese Oxide Coated, MCS, Modified, Monolayer, Montmorillonite, N-2, N2, Oxides Modified Diatomite, pH, Removal, RS, Sepiolite, Solution, Sorption, Strength, Structure, Surface, Temperature, Thermodynamic, Waste-Water, XRD

? Aydin, H. and Yerlikaya, C. (2010), Utilization of shells of hazelnut modified with Reactive Orange 122 as adsorbent for the removal of Cu(II). *Desalination and Water Treatment*, **20** (1-3), 123-132.

Full Text: [2009\Des Wat Tre20, 123.pdf](2009/Des%20Wat%20Tre20,%20123.pdf)

Abstract: The influence of reactive dye modification on the efficiency of adsorption capacities of hazelnut shells was investigated. To that end, natural adsorbents such as shells of unmodified hazelnut (RH), and modified hazelnut (MH) were used. The removal of Cu(II) by these adsorbents from aqueous solution was investigated by using several parameters such as modification, contact time, temperature and pH. The adsorption process attained equilibrium within 60 min. The extent of Cu(II) removal increased with increasing the contact time, temperature and pH and also with modification by Reactive Orange 122 as the adsorbent. Optimum pH value for Cu(II) adsorption was determined between 4-5. The experimental data were analysed by the Langmuir and Freundlich models of adsorption. It was found that the Langmuir equation fited better than the Freundlich equation. The maximum adsorption capacities for Cu(II) onto RH and MH at 298, 308 and 318 K were found to be 3.95, 4.65, and 4.74, 7.00, 8.12 and 8.61 mg/g, respectively. In addition, the adsorption data obtained at different temperatures of Cu(II) by adsorbents were applied to the pseudo first-order, pseudo second-order and Weber-Morris equations, and the rate constants of the first-order adsorption (k(1)), the rate constants of the second-order adsorption (k(2)) and intraparticle diffusion rate constants (k(3)) at these temperatures were calculated, respectively. The rates of adsorption were found to conform the pseudo second-order kinetics with good correlation (R-2 >= 0.991). The data obtained from the adsorption isotherms at different temperatures were used to calculate some thermodynamic quantities such as free energy of adsorption (ΔGº), enthalpy (ΔHº) and entropy (ΔSº). It is expected that ΔG degrees is negative, indicating that the nature of the adsorption process for Cu(II) is spontaneous. The positive value of ΔH degrees indicates that the adsorption of Cu(II) onto adsorbents is an endothermic process. The positive value of ΔSº reflects the affinity of the adsorbent for Cu(II). As a result, the hazelnut shells (both modified and unmodified), inexpensive and easily available material, can be an alternative for more costly adsorbents used for Cu((II) removal from wastewater.

Keywords: Acid Dyes, Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Capacities, Adsorption Isotherms, Alternative, Aqueous Solution, Aqueous-Solutions, Correlation, Cu(II), Cu(II) Removal, Data, Diffusion, Dye, Efficiency, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Experimental, First Order, Fly-Ash, Freundlich, Freundlich Equation, Hazelnut Shell, Heavy-Metal Ions, Industrial-Wastes, Intraparticle Diffusion, Isotherm, Isotherms, Kinetics, Langmuir, Langmuir Equation, Low-Cost Adsorbents, Models, Modification, Modified, Modified Barks, Natural, Natural Adsorbents, pH, Ph Value, Pseudo First Order, Pseudo First-Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Constants, Rates, Reactive Dye, Reactive Orange 122, Removal, Rh, Sawdust, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Solution, Temperature, Thermodynamic, Thermodynamics, Value, Waste-Water, Wastewater

? Zhang, D., He, H.J., Li, W., Gao, T.Y. and Ma, P. (2010), Biosorption of cadmium(II) and lead(II) from aqueous solutions by fruiting body waste of fungus *Flammulina velutipes*. *Desalination and Water Treatment*, **20** (1-3), 160-167.

Full Text: [2010\Des Wat Tre20, 160.pdf](2010/Des%20Wat%20Tre20,%20160.pdf)

Abstract: The biosorption of Cd2+ and Pb2+ by fruiting body wastes of macrofungi Flammulina velutipes was studied. The factors affecting absorbtion including pH, initial metal concentration, biosorbent dosages and mutual competitive biosorption of both metal ions were focused. The sorption of Cd2+ and Pb2+ was increased with pH value from 2 to 6 and maximum biosorption was at pH 6. The quantity of Cd2+ and Pb2+ adsorbed increased with the initial concentration of metal ions and both metals removal gradually increased with the biosorbent dosage. There existed mutual competitive biosorption between Cd2+ and Pb2+ when they were in the same solution. The Langmuir isotherm model fitted both metal ions sorption data well in the experiment and the calculated maximum sorption capacity of Cd2+ and Pb2+ by F. velutipes was 8.4317 mg/g dry biomass with R-2 of 0.9228 and 18.3486 mg/g dry biomass with R-2 of 0.9280, respectively. Pseudo-first order equation fitted for adsorption data of Cd2+ with R-2 of 0.9504, while pseudo-second order equation more fitted for adsorption data of Pb2+ with R-2 of 0.9917.

Keywords: Adsorption, Alginate Gel, Aqueous Solutions, *Aspergillus-niger*, Biomass, Biosorbent, Biosorption, Cadmium(II), Capacity, Cd2+, Competitive, Competitive Biosorption, Concentration, Copper, Data, Dry Biomass, Experiment, Flammulina Velutipes, Fungus, Heavy-Metals, Ions, Isotherm, Isotherm Model, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Lead(II), Lentinus-Sajor-Caju, Macrofungi, Metal, Metal Ions, Metals, Metals Removal, Model, Pb2+, pH, pH Value, Phanerochaete-Chrysosporium, Pseudo Second Order, Pseudo-First and Second-Order Equation, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Solution, Solutions, Sorption, Sorption Capacity, Trametes-Versicolor, Value, Waste

? Gupta, S. and Babu, V. (2010), Experimental, kinetic, equilibrium and regeneration studies for adsorption of Cr(VI) from aqueous solutions using low cost adsorbent (activated flyash). *Desalination and Water Treatment*, **20** (1-3), 168-178.

Full Text: [2010\Des Wat Tre20, 168.pdf](2010/Des%20Wat%20Tre20,%20168.pdf)

Abstract: In the present study, activated flyash - a low-cost adsorbent, is used as for Cr(VI) removal from aqueous solutions. Flyash is activated by giving heat treatment and with the use of concentrated sulfuric acid (98% w/w). Batch adsorption experiments are carried out to investigate the effect of influencing process parameters such as initial pH, change in pH during adsorption, contact time, adsorbent amount, and initial Cr(VI) concentration. The maximum adsorption of Cr(VI) on activated flyash is found at an initial pH value of 1. The value of pH increases with increase in adsorption of Cr(VI). The equilibrium data for adsorption of Cr(VI) on activated flyash is tested with different adsorption isotherm models such as Langmuir, Freundlich, Redlich-Peterson, Koble-Corrigan, Tempkin, Dubinin-Radushkevich and generalized isotherm models. The Koble-Corrigon isotherm model is found to be the most suitable one for Cr(VI) adsorption using activated flyash. The maximum adsorption capacity obtained is 21.9 mg g-1 at a pH value of 1. The adsorption process follows the second order kinetics and the corresponding rate constants are obtained at different initial Cr(VI) concentrations. Desorption of Cr(VI) from activated flyash using acid and base treatment shows a higher desorption efficiency by more than 85%. A feasible methodic solution for the disposal of contaminant (acid and base solutions) containing high concentration of Cr(VI) obtained during the desorption process is proposed.

Keywords: Activated Fly Ash, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherm Models, Aqueous Solutions, Batch Adsorption, Batch Studies, Biosorption, Capacity, Carbon, Coir Pith, Concentration, Contaminant, Cost, Cr(VI), Cr(VI) Adsorption, Data, Desorption, Disposal, Efficiency, Electroplating Waste-Water, Equilibrium, Experiments, Flyash, Freundlich, Heat-Treatment, Heavy Metal Removal, Heavy-Metals, Hexavalent Chromium, Ion Removal, Isotherm, Isotherm Model, Isotherm Models, Kinetic, Kinetics, Langmuir, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Model, Models, pH, Ph Value, Rate Constants, Redlich-Peterson, Regeneration, Removal, Sawdust, Second Order, Second Order Kinetics, Second-Order, Solution, Solutions, Tamarind Seeds, Treatment, Value, Water Pollution, Wheat-Straw

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Full Text: [2010\Des Wat Tre20, 179.pdf](2010/Des%20Wat%20Tre20,%20179.pdf)

Abstract: Aquatic bryophytes are frequently used as biomonitors for trace metals in aquatic ecosystems. Nevertheless, their special characteristics also allow using them as biosorbents to clean industrial wastewaters. As biosorption is a low-cost and effective method for treating metal-bearing wastewaters, understanding the process kinetics is relevant for design purposes. In this study, the ability of the aquatic bryophyte Fontinalis antipyretica to remove lead from simulated wastewaters was evaluated. Previously, the effect on biosorption of parameters such as the initial solution pH, contact time and initial metal ion concentration was investigated. The biosorption process is highly pH-dependent, and the favorable pH for maximum Pb2+ adsorption on the aquatic moss was found to have an optimum value in the range 4.0-6.0. The equilibrium sorption capacity of lead by Fontinalis antipyretica increased with the initial metal concentration. For an initial metal concentration of 10 mg L-1, the uptake capacity at equilibrium was 4.8 mg g-1. Nevertheless, when the initial concentration increased up to 100 mg L-1, the uptake of lead was 10 times higher. Maximum adsorption rates were achieved almost in the first 10-20 min of contact, and a further increase in the contact time had a negligible effect on the Pb2+ sorption. Three kinetic models (pseudo-first order, pseudo-second order and Elovich) were fitted to the experimental data and compared by the F-test. The pseudo-second order biosorption kinetic model provided the better correlation with the experimental data (R-2 = 1.00). Probably the chemisorption is the rate-limiting step and the biosorption mechanism follows a pseudo-second order reaction model. The applicability of the Langmuir and Freundlich adsorption isotherms to the present system was also assessed. The equilibrium experimental data of lead sorption was very well described by the Langmuir model with R-2 values exceeding 0.993. The maximum lead sorption capacity by Fontinalis antipyretica attained a value of 68 mg of lead ions per gram of aquatic moss.

Keywords: Adsorption, Adsorption Isotherms, Aquatic Ecosystems, Aquatic Moss, Aquatic Mosses, Aqueous-Solutions, Bagasse Fly-Ash, Biomass, Biomonitors, Biosorbents, Biosorption, Biosorption, Biosorption Kinetic, Biosorption Mechanism, Capacity, Characteristics, Chemisorption, Concentration, Correlation, Data, Design, Ecosystems, Elovich, Equilibrium, Experimental, Extraction Algal Waste, First, Fontinalis Antipyretica, Freundlich, Ions, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, L1, Langmuir, Langmuir Model, Lead, Low Cost, Mechanism, Metal, Metal-Ions, Metals, Model, Modelling, Models, Pb(II), Pb2+, Pb2+ Adsorption, pH, pH-Dependent, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Limiting Step, Rate-Limiting Step, Rates, Removal, Solution, Sorption, Sorption Capacity, Sugar-Industry Waste, Trace Metals, Understanding, Uptake, Value, Wastewaters, Water

? Vijaya, Y., Subbaiah, M.V., Reddy, A.S. and Krishnaiah, A. (2010), Equilibrium and kinetic studies of fluoride adsorption by chitosan coated perlite. *Desalination and Water Treatment*, **20** (1-3), 272-280.

Full Text: [2010\Des Wat Tre20, 272.pdf](2010/Des%20Wat%20Tre20,%20272.pdf)

Abstract: A new biosorbent was developed by coating chitosan, a naturally and abundantly available biopolymer, on to perlite. The surface morphology of chitosan coated perlite (CCP) was observed using scanning electron microscopic (SEM) studies. Fourier transform infrared spectroscopy (FTIR) was used for the determination of functional groups responsible for fluoride sorption. The adsorption characteristics of CCP towards fluoride were studied under batch equilibrium and column flow experimental conditions. The effect of different process parameters such as pH, time, and concentration of fluoride and adsorbent dose on adsorption of fluoride was investigated. The data were analyzed on the basis of Lagergren first-order, pseudo-second-order and Weber-Morris models. The adsorption of fluoride on CCP followed pseudo-second-order kinetics. Break through curves were obtained from column flow adsorption data. The fluoride loaded CCP was regenerated using 0.1 N NaOH.

Keywords: Adsorbent, Adsorbent Dose, Adsorption, Aqueous-Solutions, Ash, Batch, Beads, Biosorbent, Ccp, Cd(II), Characteristics, Chitosan, Coated, Coating, Column, Concentration, Data, Defluoridation, Donnan Dialysis, Drinking-Water, Equilibrium, Experimental, First Order, Flow, Fluoride, Fluoride Adsorption, FTIR, Functional Groups, Infrared Spectroscopy, Isotherms, Kinetic, Kinetic Studies, Kinetics, Lagergren, Models, Morphology, N, NaOH, Perlite, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, SEM, Sorption, Spectroscopy, Surface, Waste

? Zhang, J.D. and Liu, F.F. (2010), Adsorption of natural organic matter onto a composite adsorbent prepared with chitosan and powdered activated carbon. *Desalination and Water Treatment*, **20** (1-3), 291-296.

Full Text: 2010\Des Wat Tre20, 291.pdf

Abstract: In this study a composite adsorbent was prepared with chitosan and powdered activated carbon (PAC). Jar tests were carried out to investigate effects of pH, adsorption time, temperature and initial concentration of natural organic matter (NOM) on the adsorbent’s removal efficiency of NOM. UV absorbance at 254 nm wavelength (UV254) was used as a surrogate parameter of NOM concentration. It is shown that the removal of NOM by chitosan-PAC composite adsorbent could be as high as 69% under optimal conditions. Pseudo-first-order rate expression and pseudo-second-order rate expression were fitted to the experimental results, and the latter was found to fit the experimental results quite well. The adsorption isotherm of NOM onto the adsorbent under various initial NOM concentrations was also experimentally determined. Freundlich isotherm was found to fit the adsorption data well.

Keywords: Absorbance, Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Carbon, Chitosan, Coagulation, Composite, Composite Adsorbent, Concentration, Data, Drinking-Water, Efficiency, Experimental, Expression, Freundlich, Freundlich Isotherm, Improved Nom Removal, Isotherm, Membrane Filtration, Natural, Natural Organic Matter, Nom, Organic, Organic Matter, PAC, pH, Powdered Activated Carbon, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Removal, Removal Efficiency, Surface-Water, Surrogate, Temperature, UV

? Hamdaoui, O., Saoudi, F. and Chiha, M. (2010), Utilization of an agricultural waste material, melon (Cucumis melo L.) peel, as a sorbent for the removal of cadmium from aqueous phase. *Desalination and Water Treatment*, **21** (1-3), 228-237.

Full Text: [2010\Des Wat Tre21, 228.pdf](2010/Des%20Wat%20Tre21,%20228.pdf)

Abstract: Melon (Cucumis melo L.) peel, an agricultural solid waste material, was utilized as a novel non-conventional sorbent for the removal of cadmium from aqueous phase. The effects of sorbent dose, pH, ionic strength, temperature, stirring speed, initial concentration and contact time on the sorption of cadmium were evaluated. Results indicate an increase in uptake by the sorbent with increasing initial cadmium concentration, solution pH and contact time. The amount of cadmium sorption decreases with increasing temperature, ionic strength and sorbent dose. Mixing rates up to 400 rpm increase uptake, however, higher mixing rates result in insignificant enhancement of uptake compared to the dissipated energy. The equilibrium sorption data of cadmium by melon peel were analyzed by Langmuir, Freundlich and Temkin isotherm models. The results indicate that the Langmuir model provides the best correlation of the experimental data, with maximum monolayer sorption capacity of 81.97 mg g-1. Pseudo-first-order, pseudo-second-order and intraparticle diffusion models were used to analyze the kinetic data obtained at different initial concentrations. Among the kinetic models studied, the pseudo-second-order model was the best applicable to describe the sorption of cadmium by melon peel. The results demonstrated that melon peel is very effective for the sorption of cadmium from aqueous solutions.

Keywords: Adsorption, Agricultural, Agricultural Solid Waste, Agricultural Waste, Aqueous Phase, Aqueous Solutions, Cadmium, Capacity, Concentration, Correlation, Cucumis Melo, Data, Diffusion, Dye, Energy, Equilibrium, Equilibrium, Experimental, Freundlich, Heavy-Metals, Intraparticle Diffusion, Ionic Strength, Isotherm, Isotherm Models, Kinetic, Kinetic Models, Kinetics, Kinetics, Langmuir, Langmuir Model, Melon Peel, Metal-Ions, Mixing, Model, Models, Monolayer, pH, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rates, Removal, Sawdust, Solid Waste, Solution, Solutions, Sorbent, Sorbent Dose, Sorption, Sorption, Sorption Capacity, Strength, Temkin, Temkin Isotherm, Temperature, Uptake, Waste, Water, Wheat Bran

? Gong, R.M., Cai, W.K., Li, N., Chen, J.A., Liang, J.J. and Cao, J.X. (2010), Preparation and application of thiol wheat straw as sorbent for removing mercury ion from aqueous solution. *Desalination and Water Treatment*, **21** (1-3), 274-279.

Full Text: [2010\Des Wat Tre21, 274.pdf](2010/Des%20Wat%20Tre21,%20274.pdf)

Abstract: In this paper, thiol wheat straw (TWS) was prepared by esterifying mercaptoacetic acid onto cellulose in wheat straw. The potential feasibility of TWS as sorbent for removing mercury ion from aqueous solution was investigated in a batch system. The Hg2+ removal was found to be dependent on initial pH, sorbent dose, Hg2+ concentration, contact time, and temperature. The maximum value of Hg2+ removal appeared in the range of pH 4 to 7. The isothermal data of Hg2+ sorption conformed well to the Langmuir model and the maximum sorption capacity (Q(m)) of TWS for Hg2+ was 72.46 mg/g. The equilibrium of Hg2+ removal was reached within 100 min. The Hg2+ removal process could be described by the pseudo-first-order kinetic model. The thermodynamic study indicated that the Hg2+ removal process was spontaneous and exothermic.

Keywords: Removal, Mercury Ion, Esterification, Mercaptoacetic Acid, Wheat Straw, Heavy-Metal Removal, Waste-Water, Rice Husk, Adsorption, Biosorption, Equilibrium, Copper, Exchange, Sorption, Zn(II)

? Radjenovic, A., Malina, J. and Strkalj, A. (2010), Removal of Ni2+ from aqueous solution by blast furnace sludge as an adsorbent. *Desalination and Water Treatment*, **21** (1-3), 286-294.

Full Text: [2010\Des Wat Tre21, 286.pdf](2010/Des%20Wat%20Tre21,%20286.pdf)

Abstract: The blast furnace sludge (BFS), by-product and waste material of steelmaking industry was utilized as an adsorbent for Ni2+ ions removal from aqueous solution. Chemical and mineralogical composition of BFS was examined by Proton Induced X-ray Emission (PIXE) and X-ray Diffraction (XRD) methods. The structural properties of BFS were characterized using Brunauer-Emmett-Teller (BET) and Scanning Electron Microscopy (SEM) methods. Batch experiments were conducted to evaluate the adsorption performance. The equilibrium adsorption level was determined to be a function of the solution concentration and temperature. Two simple kinetic models, pseudo-first and second-order, were used to investigate the adsorption mechanisms. The pseudo-second-order reaction kinetics provides the best correlation with the experimental data. The equilibrium data were analyzed using the Langmuir and Freundlich isotherms. The characteristic parameters for each isotherm were found. The results obtained from Freundlich’s isotherm are slightly better than those obtained from Langmuir’s isotherm. The thermodynamic parameters have been determined. The negative values of free energy change (ΔG) indicated the spontaneous nature of the adsorption of Ni2+ on blast furnace sludge and the positive values of enthalpy change (ΔH) suggested the endothermic nature of the adsorption process. The observed adsorption capacity for Ni2+ ions is a good indicator of BFS potential for its use in aqueous sorption system.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Mechanisms, Adsorption Performance, Almond, Aqueous Solution, BET, Blast Furnace Sludge, By-Product, Cadmium, Capacity, Composition, Concentration, Copper, Correlation, Data, Endothermic, Energy, Enthalpy, Equilibrium, Experimental, Experiments, Freundlich, Function, Heavy-Metal Ions, Indicator, Ions, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir and Freundlich Isotherms, Mechanisms, Methods, Models, Ni2+, Nickel, Performance, Potential, Pseudo Second Order, Pseudo-First And, Pseudo-Second-Order, Reaction Kinetics, Recovery, Removal, Second Order, Second-Order, SEM, Slag, Sludge, Solution, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Waste, Waste-Water, X-Ray, XRD

? Hameed, B.H. and Tan, I.A.W. (2010), Nitric acid-treated bamboo waste as low-cost adsorbent for removal of cationic dye from aqueous solution. *Desalination and Water Treatment*, **21** (1-3), 357-363.

Full Text: [2010\Des Wat Tre21, 357.pdf](2010/Des%20Wat%20Tre21,%20357.pdf)

Abstract: The feasibility of nitric acid-treated bamboo waste (NBW) for the removal of methylene blue (MB) from aqueous solutions was investigated. Batch adsorption studies were conducted to study the effects of contact time (0-180 min), initial concentration (45-375 mg/L) and solution pH (2-10) on the removal of dye at 30ºC. The experimental data were analyzed by using four different types of linearized Langmuir and the Freundlich isotherms. Equilibrium data fitted well with the type 1 Langmuir model, yielding maximum monolayer MB adsorption capacity of 87.719 mg/g. The kinetic data were found to conform to pseudo-second-order kinetic model with good correlation. Intraparticle diffusion model was further tested to identify the diffusion mechanism. The scanning electron micrographs showed that MB was adsorbed on the rough surface of NBW. The NBW prepared in this study was shown to be a promising low-cost material for adsorption of MB from aqueous solutions.

Keywords: Adsorbent, Adsorption, Adsorption Behavior, Adsorption Capacity, Agricultural Waste, Aqueous Solution, Aqueous Solutions, Bamboo, Bamboo Waste, Basic Dye, Batch, Batch Adsorption, Biosorption, Capacity, Cationic Dye, Concentration, Correlation, Data, Diffusion, Diffusion Model, Dye, Equilibrium, Experimental, Feasibility, Freundlich, Intraparticle Diffusion, Intraparticle Diffusion Model, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Model, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Low-Cost Material, MB, Mechanism, Methylene Blue, Model, Monolayer, Parthenium Biomass, Peel, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Solution, Solutions, Sorption, Surface, Waste, Water

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Full Text: [2010\Des Wat Tre22, 1.pdf](2010/Des%20Wat%20Tre22,%201.pdf)

Abstract: The adsorption of cetyltrimethylammonium bromide (CTAB), a well known cationic surfactant on silica gel and its application for organic bearing wastewater treatment was studied in detail. The study was conducted for both CTAB-spiked distilled water and real wastewater. The studies on adsorbent dose variation and removal kinetics were conducted to find the optimum dose and equilibrium contact time for CTAB removal. Interestingly, the adsorption capacity was found to be very high for real wastewater and the reaction occurred very rapidly compared to that of CTAB-spiked distilled water samples. The kinetic study revealed that the reaction followed the pseudo-second order reaction kinetics model. The isotherm followed four region isotherm models. The effects of various parameters such as pH, presence of electrolytes and operating conditions on the adsorption process were studied. High adsorption capacity was observed in presence of electrolytes and in alkaline condition. Kinetic study determined the rate limiting to be chemisorption. Regeneration of silica gel after its complete exhaustion was efficiently done using hydrochloric acid (18%). After the surfactant removal, the surfactant modified silica gel (SMSG) was efficiently used for the removal of dyes and herbicide from water environment through the process called adsolubilization. Therefore, this would be a simple and efficient process for treatment of organic bearing wastewater especially textile wastewater.

Keywords: Adsolubilization, Adsorbent, Adsorption, Adsorption Capacity, Biodegradation, Capacity, Cationic, Cationic Surfactant, Cetyltrimethylammonium Bromide, Chemisorption, Clinoptilolite, Complete, Contact Time, Ctab, Dye, Dyes, Environment, Equilibrium, Herbicide, Hydrochloric Acid, Interface, Isotherm, Isotherm Models, Kinetic, Kinetic Study, Kinetics, Mechanism, Model, Models, Modified Alumina, Modified Silica Gel, Operating Conditions, pH, Process, Pseudo Second Order, Pseudo-Second Order, Regeneration, Removal, Silica, Silica Gel, Sorption, Surfactant, Surfactant Modified Silica Gel, Textile, Treatment, Wastewater, Wastewater Treatment, Water, Water Samples, Zeolite

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Full Text: [2010\Des Wat Tre22, 17.pdf](2010/Des%20Wat%20Tre22,%2017.pdf)

Abstract: The efficiency of humic acids (HA) removal from aqueous solutions by complexation-ultra-filtration (COUF) process, in the presence of the cationic water-soluble polymer, poly(diallyl dimethylammonium chloride) (PDADMAC) of different average Mw were studied; also the effect of mass ratio of HA to polymer, pH of solution on the HA removal were evaluated. The results show that the HA rejection on ultrafiltration PBCC membrane (Millipore) varied from 70 to 99.9% with addition of PDADMAC, depending on average Mw, when a HA/polymer mass ratio was changed from 1:1 to 1:7. The solute rejection to some extent improved with an increase in the concentration of polymeric complexing agents due to a higher completeness of the HA binding. It was found that the HA removal change with pH value of the feed solution, owing to protonation of the quaternary amino groups of this polymer.

Keywords: Acids, Adsorption, Amino, Aquatic Humic Substances, Aqueous Solutions, Cationic, Coagulation, Complexation, Filtration, HA, Humic Acids, Natural Organic Matter, NF Membrane, Nom, Organic Matter, pH, Poly(Diallyl Dimethylammonium Chloride), Polymer, Process, Removal, Soluble Polymers, Solution Chemistry, UF, Ultrafiltration, Water

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Full Text: [2010\Des Wat Tre22, 30.pdf](2010/Des%20Wat%20Tre22,%2030.pdf)

Abstract: In this study, drying kinetics and sorption isotherms of cornelian cherry fruit are investigated under various drying air conditions. Experiments are conducted in a lab-scale convective drier under the following drying conditions: temperatures at 25, 30, 40, 50 and 60 degrees C; velocities at 0.3, 0.6 and 0.9 m/s; relative humidity values at 25%, 40%, 55% and 70%. Sorption isotherms of the dried cornelian cherry fruit are determined for different temperatures and water activity values at first. At a given water activity, the results show that the equilibrium moisture content decreases with increase in temperature. The experimental sorption curves are then described by the GAB, Oswin, Smith and Halsey models. A nonlinear regression analysis method was used to evaluate the constants of the sorption equations. The GAB model was found to be suitable for describing the sorption curves. Later, drying experiments are conducted for various values for drying air. The experimental moisture data were fitted to some models available in the literature, mainly the Henderson and Pabis model, the Lewis model and the two-term exponential model and, a good agreement was observed.

Keywords: Activity, Analysis, Carrots, Convective Air Drying, Cornelian Cherry Fruit, Cornus-Mas L., Desorption Isotherms, Drying Kinetics, Equilibrium, Humidity, Isosteric Heat, Isotherms, Kinetics, Kinetics And Sorption, Leaves, Literature, Model, Models, Parameters, Potatoes, Sorption, Sorption Isotherm, Sorption Isotherms, Temperature, Theoretical-Analysis, Thin-Layer, Water

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Full Text: [2010\Des Wat Tre22, 117.pdf](2010/Des%20Wat%20Tre22,%20117.pdf)

Abstract: Pleurotus cornucopiae was used as biosorbent for the adsorption of Cu(II) ions in water. The adsorption process was carried out in a batch process and the effects of contact time, initial pH, initial Cu(II) ion concentration, adsorbent amount on the adsorption were investigated. The removal percentage of Cu(II) was increased with an increase in pH, biomass concentration and a decrease in Cu(II). Pleurotus cornucopiae exhibited the highest Cu(II) uptake of 25.25 mg . g(-1) of biomass at pH 5 in the presence of 100 mg l(-1) Cu(II) at 298 degrees K. The experimental isotherm data were analysed using the Langmuir, Freundlich and Temkin equations. It was observed that Langmuir model exhibited the best fit to experimental data. The experimental data were analysed using four sorption kinetic models the pseudo first and second order equations, and the Elovich and the Intraparticle diffusion equation to determine the best fit equation for the biosorption of Cu(II) ions onto Pleurotus cornicopiae. Pseudo second order model described well the sorption kinetic of Cu(II) ions in comparison to pseudo first order, Elovich equation and Intra-particle diffusion kinetic model. Fourier transform infrared analysis revealed that hydroxyl, carboxyl, amino functional groups were mainly responsible for Cu(II) biosorption.

Keywords: Adsorbent, Adsorption, Amino, Analysis, Aqueous Solutions, Bagasse Fly-Ash, Batch, Biomass, Biosorbent, Biosorption, Comparison, Contact Time, Copper, Copper(II), Cu(II), Cu(II) Ions, Diffusion, Diffusion Equation, Elovich, Elovich Equation, Equilibrium Studies, Fourier Transform Infrared, Freundlich, Heavy-Metals, Infrared, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherm, Kinetic, Kinetic Model, Kinetic Models, Kinetic Studies, Langmuir, Langmuir Model, Low-Cost Adsorbent, Model, Models, pH, Process, Pseudo-Second-Order, Red Mud, Removal, Sorption, Sugar-Industry Waste, Temkin, Uptake, Water

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Full Text: [2010\Des Wat Tre22, 146.pdf](2010/Des%20Wat%20Tre22,%20146.pdf)

Abstract: The effectiveness of adsorption for dye removal from wastewater has made it an ideal alternative to other expensive treatment options. The removal of Safranine onto Parthenium hysterophorus L (congress grass) (CG) from aqueous solutions was investigated using parameters such as contact time, pH, adsorbent doses, and initial dye concentration. Adsorption isotherms of dye onto CG were determined and correlated with common isotherm equations such as the Langmuir and Freundlich model. Adsorption equilibrium was reached within 40 min. Parameters of the Langmuir and Freundlich isotherms were determined using adsorption data. The maximum adsorption capacity of Safranine onto CG was found to be 89.3 mg/g at 400 mg/l of dye concentration. The equilibrium data satisfied Langmuir isotherm better than Freundlich isotherm. The rate constants were evaluated for initial dye concentration and adsorbent doses. The experimental data fit the pseudo-second-order kinetic model.

Keywords: Acid Dyes, Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Adsorption Isotherms, Aqueous Solutions, Aqueous-Solutions, Biosorption, Capacity, Contact Time, Dye, Dye Removal, Equilibrium, Freundlich, Freundlich Isotherm, Freundlich Model, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir And Freundlich Isotherms, Langmuir Isotherm, Model, Parthenium Hysterophorus, pH, Pseudo Second Order, Reactive-Dye, Removal, Safranine, Sorbents, Sorption, Textile Dyes, Thermodynamics, Treatment, Wastewater, XRD

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Full Text: [2010\Des Wat Tre22, 174.pdf](2010/Des%20Wat%20Tre22,%20174.pdf)

Abstract: The aim of this study was to explore the feasibility of using skin almonds (SA), a new agricultural sorbent, for the removal of hazardous dye methyl orange (MO). The first objective of this work was to examine the influence of different chemical treatments on the adsorption capacity of SA. The treatment of SA with alkaline solution as well as with salt solution decreased the sorption ability for MO, whereas the acidic treatment increased markedly the sorption ability for the anionic dye. The next objective was to evaluate the properties of the adsorbent, the effect of the contact time, the temperature, the dye concentration and the particles size. Adsorption of the dye on both adsorbents (natural and treated) has been monitored through the Langmiur, Freundlich and Redlich-Peterson adsorption isotherm models and it was shown that the adsorption process followed as Freundlish isotherm, which led to the higher correlation coefficient. Two kinetic models, pseudo second order and Elovich equation were employed to analyze kinetics data. It was found that the pseudo second-order was the most relevant to describe the adsorption behavior. In addition, the activation energy was also determined based on the pseudo-second order rate constants.

Keywords: Activation, Activation Energy, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherm, Aqueous Solutions, Basic Dye, Biosorption, Capacity, Chemical Treatments, Contact Time, Dye, Dye Adsorption, Elovich, Elovich Equation, Equilibrium, Fly-Ash, Freundlich, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetic Models, Kinetics, Methyl Orange, MO, Models, Process, Pseudo Second Order, Pseudo-Second Order, Reactive Dyes, Removal, Skin, Skin Almonds, Sorbent, Sorption, Temperature, Treatment, Wastewaters

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Full Text: [2010\Des Wat Tre22, 258.pdf](2010/Des%20Wat%20Tre22,%20258.pdf)

Abstract: Fixed bed column study were carried out to investigate the performance of iron oxide-coated zeolite (IOCZ) in removal of methylene blue (MB) and methyl orange (MO) from aqueous solution in single dye system. The effects of various experimental conditions, such as the flow rate, initial metal concentration and bed depth were studied. The Thomas model, Modified-dose-response model (MDR) and the bed depth service time (BDST) model were used to fit the experimental data. The results were that MDR model was better for the description of breakthrough curves at all experimental conditions than Thomas model. BDST model was applied to predict the service times with various flow rate and initial concentration. IOCZ can be used to remove dyes from solution.

Keywords: Adsorption, Biosorption, Breakthrough, Breakthrough Curves, Carbon, Column, Column Study, Copper(II), Dye, Dyes, Fixed Bed Column, Fixed-Bed, Iron, Iron Oxide-Coated Zeolite (IOCZ), Low-Cost Adsorbents, Methyl Orange, Methylene Blue, MO, Model, Natural Zeolite, Removal, System, Thomas Model, Treatment Technologies, Water, Zeolite

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Full Text: [2010\Des Wat Tre22, 330.pdf](2010/Des%20Wat%20Tre22,%20330.pdf)

Abstract: A novel spherical 5-amino-2-benzotriazol-2-yl-phenol (ABP) chelating sorbent is synthesized simply and rapidly from 2-nitroanilin and 3-nitrophenol characterized (IR, H-1 NMR spectra and scanning electron microscopy) and studied for the preconcentration and determination of trace Zn(II) ion from aqueous solution samples. The concentration of metal ion in the solution was determined by flame atomic absorption spectrometry (FAAS). The optimum pH value for sorption of the metal ion was 6.5. The sorption capacity of ABP for Zn(II) was determined. The chelating ABP can be reused for 20 cycles of sorption-desorption without any significant change in sorption capacity. A recovery of 86% was obtained for the metal ion with 0.5 M HNO3 as eluting agent. The equilibrium adsorption data of Zn(II) on sorbent were analyzed by the Langmuir and Freundlich models. Based on equilibrium adsorption data the Langmuir and Freundlich constants were determined 0.0074 and 1.200 at pH 6.5 and 25 degrees C.

Keywords: 5-Amino-2-Benzotriazol-2-Yl-Phenol, Absorption, Adsorption, Amberlite XAD-2, Atomic Absorption Spectrometry, Capacity, Determination, Emission-Spectrometry, Equilibrium, FAAS, Flame Atomic Absorption Spectrometry, Flow-Injection, Freundlich, Immobilization, IR, Isotherm Study, Langmuir, Lead(II), Metal-Ion Enrichment, Models, NMR, Online Preconcentration, pH, Preconcentration, Recovery, Separation, Silica-Gel, Solid Phase Extraction, Solid-Phase Extraction, Sorbent, Sorption, Synthesis, Trace-Elements, Water, Water Samples, Zinc, Zn(II)

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Full Text: [2010\Des Wat Tre22, 340.pdf](2010/Des%20Wat%20Tre22,%20340.pdf)

Abstract: The inhibition effect of some quinazoline derivatives on the corrosion of copper in 2 M HNO3 has been investigated by weight loss and polarization studies. The inhibition efficiency increased with increase in inhibitor concentration but decreased with the increase in temperature. The thermodynamic functions of dissolution and adsorption processes were calculated. The polarization measurements indicated that the inhibitors are of mixed-type. The kinetic parameters of corrosion of copper in HNO3 solution have been determined. The adsorption of the compounds was found to obey Frumkin’s adsorption isotherm. It is observed that the combination between these quinazoline derivatives and halide ions shows good inhibition efficiency. The results obtained from weight loss and galvanostatic polarization are in good agreement.

Keywords: Adsorption, Adsorption Isotherm, Coatings, Compounds, Copper, Corrosion, Decylamine, Electrochemical-Behavior, Halide-Ions, HNO3, Hydrochloric-Acid Solution, Inhibition, Inhibition Efficiency, Inhibitor, Inhibitors, Isotherm, Kinetic, Nacl Solutions, Nitric-Acid, Polarization, Quinazoline Derivatives, Steel, Sulfuric-Acid, Temperature, Thermodynamic, Weight, Weight Loss

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Full Text: [2010\Des Wat Tre22, 349.pdf](2010/Des%20Wat%20Tre22,%20349.pdf)

Abstract: This study considers Jordanian zeolite as adsorbent for the removal of cadmium from aqueous solution. Zeolite collected from a geographic zone in Jordan valley was assesses for its ability to adsorb heavy metal after preliminary treatment. Kinetics and equilibrium of cadmium uptake by this new adsorbent were followed in this investigation. The experimental results showed that the adsorption of Cd2+ ions on zeolite sands was dependent on the pH and temperature. The uptake of cadmium ions increased with increasing pH, temperature and initial adsorbate concentration. Cadmium per unit adsorbent decreased with the increase in the amount of adsorbent used; while the percentage of cadmium removal increased with the increase in the amount of adsorbent. Addition of electrolyte, as NaCl, to zeolite-metal suspension decreased metal uptake by the zeolite.

Keywords: Adsorbent, Adsorption, Adsorption, Aqueous Solutions, Cadmium, Cadmium Removal, Cd2+, Equilibrium, Heavy Metal, Jordanian Natural Zeolite, Kinetics, NaCl, Natural Zeolite, pH, Removal, Sorbent, Temperature, Treatment, Uptake, Zeolite

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Full Text: [2010\Des Wat Tre22, 363.pdf](2010/Des%20Wat%20Tre22,%20363.pdf)

Abstract: Guava seeds, a byproduct produced during guava juice processing, are currently of no economic value. In the present work two different types of adsorbents have been prepared from raw guava seeds, namely chemically activated guava seed carbon (AGSC) using zinc chloride and chemically modified guava seeds (MGS) through graft co-polymerization reaction. The adsorption capacity of both adsorbents towards Ni(II) has been investigated. It has been found that the equilibrium adsorption capacity is a function of initial pH, contact time, initial nickel(II) concentration, and adsorbent dosage. The optimum pH for both adsorbents was found to be 6. Both Langmuir and Freundlich models best describe the equilibrium experimental data. The maximum adsorption capacities for AGSC and MGS are 18.05 and 32.05 mg/g respectively. The kinetic experimental data were fitted well by the second-order model. The natures of the main functional groups which may be present on raw guava seeds and MGS have been investigated by infrared (IR) studies.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Capacity, Agriculture Residues, Aqueous-Solutions, Capacity, Carbon, Chemically Modified Adsorbents, Contact Time, Copper, Cu(II), Equilibrium, Freundlich, Graft Copolymerization, Heavy Metal, Infrared, Ions, IR, Kinetic, Langmuir, Metal Removal, Model, Models, Ni(II), Nickel, Nickel Ions Removal, pH, Preparation, Removal, Sawdust, Waste-Water, Wastewater Treatment, Zinc

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Full Text: [2010\Des Wat Tre23, 20.pdf](2010/Des%20Wat%20Tre23,%2020.pdf)

Abstract: Microthrix parvicella is the dominant filamentous microorganism prevailed in biological nutrient removal (BNR) activated sludge systems experiencing temporarily or even permanently filamentous bulking and foaming problems. Reports regarding the ability of M. parvicella to uptake and utilize long chain fatty acids (LCFA) are rather controversial. In the context of this study a series of carbon uptake batch experiments with oleate as the external substrate under aerobic, anoxic and anaerobic conditions were performed in order to investigate the biosorption capacity of activated sludge samples experiencing serious filamentous bulking and foaming problems due to M. parvicella proliferation. According to the results LCFA removal efficiency is reversely proportional to the applied organic loading. Removal efficiencies in the order of 70-90% were observed under aerobic conditions for floc loadings lower than 100 mgCOD/gSS, whereas lower removal efficiencies were experienced (30-40%) for significantly higher floc loadings. Similar correlation of removal efficiencies with floc loading was evidenced under anaerobic and anoxic conditions (50% LCFA removal for floc loadings lower than 100 mgCOD/gSS). Based on these findings it can be stated that under the conditions prevailing in anaerobic, anoxic and aerobic selector tanks, only a portion of LCFA is removed, and therefore the remaining LCFA under the completely mixed conditions prevailing at the aeration zone of a bioreactor would establish low enough floc loadings, thus stimulating M. parvicella growth.

Keywords: Activated Sludge, Activated-Sludge Systems, Batch, Batch Experiments, Biological, Bioreactor, Biosorption, Bulking, Bulking-Sludge, Capacity, Carbon, Context, Control, Correlation, Efficiency, Experiments, Filaments, Floc Loading, Foaming, Growth, Loading, Loadings, Long Chain Fatty Acids, Microorganism, Microthrix Parvicella, Nov, Nutrient, Nutrient Removal, Organic, Organic Loading, Plants, Proliferation, Removal, Removal Efficiency, Selector Tanks, Sludge, Systems, Uptake

? Demircivi, P. and Nasun-Saygili, G. (2010), Removal of boron from waste waters using HDTMA-modified zeolites. *Desalination and Water Treatment*, **23** (1-3), 110-117.

Full Text: [2010\Des Wat Tre23, 110.pdf](2010/Des%20Wat%20Tre23,%20110.pdf)

Abstract: In this study, boron removal is implemented by adsorption process using modified natural zeolite. Due to natural zeolites have no affinity for anions, Hexadecyltrimethylamine (HDTMA) was used to modifiy natural zeolites. Experiments were run in both batch and column systems. Batch studies were performed to investigate the effects of various experimental parameters, such as optimum HDTMA loading level, adsorbent dose, initial concentration and pH, on the removal of boron. It is found that removal of boron increases while adsorbent dose and initial concentration increase at the optimum pH level 8.5 and HDTMA loading level 100%. Equilibrium isotherms of batch system were also analyzed by Langmuir and Freundlich isotherm models. Freundlich isoterm model represents the sorption process very well for batch system. Effect of bed height, flow rate and initial concentration on boron removal were investigated in column experiments. All the solutions that were used for the column system were adjusted optimum pH level 8.5. As a result of these experiments, removal of boron increases with increasing bed height and decreases with increasing flow rate and initial concentration. Thomas and BDST models were used for column system analyzing. Thomas and BDST models are well agree with experimental data.

Keywords: Adsorbent, Adsorbent Dose, Adsorption, Adsorption, Anions, Batch, Batch System, BDST, Boron, Boron Removal, Clinoptilolite, Column, Column Experiments, Concentration, Data, Equilibrium, Equilibrium Isotherms, Experimental, Experiments, Flow, Flow Rate, Freundlich, Freundlich Isotherm, Hdtma-Zeolite, Ion-Exchange, Isotherm, Isotherm Models, Isotherms, Langmuir, Loading, Model, Modelling, Models, Modified, Natural, Natural Zeolite, Natural Zeolites, NOV, pH, Removal, Soils, Solutions, Sorption, Sorption Process, Surfactant-Modified Zeolite, Systems, Waste, Waste Waters, Waters, Zeolite, Zeolites

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Full Text: [2010\Des Wat Tre23, 152.pdf](2010/Des%20Wat%20Tre23,%20152.pdf)

Abstract: Microcystins (MCs) are dangerous toxins produced by cyanobacteria in eutrophic waters, that are increasingly used worldwide for human consumption after potabilization. In this study, we present the results of laboratory and pilot-plant experiments, aimed at deepening the knowledge of the mechanisms governing the equilibrium of dissolved and particulate-bound MCs, and exploring the possible use of ultrafiltration (UF) for their removal from eutrophic water within the potabilization treatment. Firstly, we analysed the presence of MCs in filtered water after three months of pure culture of Microcystis aeruginosa and different cycles of freezing and thawing, showing an increase of dissolved MCs due to cell breakage caused by the refrigeration cycles. Secondly, we performed filtration tests in a pilot UF plant, using samples of demineralised water and raw water from a eutrophic lake, both spiked with MCs. The tests demonstrated the possibility to remove MCs by adsorption rather than by mechanical seizing. The tests with demineralised water denoted a tendency to desorption after reaching the adsorption equilibrium, an adsorption isotherm less effective than the one observed in earlier lab-scale studies, and the need for very well controlled chemical washings to clean the membranes. Conversely, the raw lake water tests showed a higher removal efficiency, allowing to reach a final concentration of less than 1 mu g/l, and a tendency to maintain the removal efficiency for longer cycles. These results allow us to discuss the role of the adsorption-release process on the efficiency of the UF process, and suggests the exploration of non-conventional operating rules aimed at maximizing the removal of MCs by UF.

Keywords: Adsorption, Adsorption, Adsorption Equilibrium, Adsorption Isotherm, Chemical, Concentration, Consumption, Culture, Cyanobacteria, Cyanotoxins, Desorption, Dissolved, Drinking Water Treatment, Efficiency, Equilibrium, Experiments, Filtration, Human, Isotherm, Knowledge, Lake, Mechanisms, Membranes, Microcystin-LR, Microcystin-LR Removal, Microcystis Aeruginosa, Nanofiltration, NOV, Pilot, Plant, Refrigeration, Removal, Removal Efficiency, Role, Treatment, UF, Ultrafiltration, Ultrafiltration Membrane, Water, Waters

? Landi, M., Naddeo, V. and Belgiorno, V. (2010), Influence of ultrasound on phenol removal by adsorption on granular activated carbon. *Desalination and Water Treatment*, **23** (1-3), 181-186.

Full Text: [2010\Des Wat Tre23, 181.pdf](2010/Des%20Wat%20Tre23,%20181.pdf)

Abstract: One of the most popular means for removal of natural organic matter found in small concentration is by adsorption. Recent studies have found that ultrasound enhances adsorption properties of different adsorbents for many contaminants in aqueous solution. This work describes the results of investigation carried out to examine the adsorption process of phenol, as an organic matter indicator, both from aqueous solution and from domestic wastewater on granular activated carbon (GAC) in absence and presence of ultrasound (US). The influence of ultrasonic power on the oxidation of phenol was also investigated at three different densities (1.06, 1.60 and 3.20 W/ml). The effects were monitored in terms of UV-absorbance at 270 nm, TOC and COD. Reduction of UV-absorbance and TOC have been negligible with US treatment alone and the performances have been better with adsorption into GAC. However, the adsorption rate of phenol in wastewater in presence of ultrasound, for an acoustical power of 1.06 W/ml, was twice higher than that obtained by simple stirring. Indeed, the combined employment of GAC adsorption and US can drastically remove organic substance thanks to a produced synergistic effect. Therefore, the combination of ultrasound and stirring for the adsorption process was shown to be of interest for the treatment of wastewater.

Keywords: 4-Chlorophenol, Activated Carbon, Adsorbents, Adsorption, Adsorption Properties, Adsorption Rate, Advanced Oxidation Process (AOPS), Aqueous Solution, Aqueous-Solutions, Carbon, Cavitation, COD, Concentration, Contaminants, Degradation, Desorption, Employment, Escherichia-Coli, Gac, Granular Activated Carbon, Inactivation, Indicator, Investigation, Irradiation, Natural, nov, Organic, Organic Matter, Oxidation, Phenol, Phenol Removal, Polymeric Resin, Power, Reduction, Removal, Small, Solution, Sonolisys, TOC, Treatment, Ultrasonic, Ultrasound, US, Waste-Water Treatment, Wastewater, Work

? Fabbricino, M. and Gallo, R. (2010), Chromium removal from tannery wastewater using ground shrimp shells. *Desalination and Water Treatment*, **23** (1-3), 194-198.

Full Text: [2010\Des Wat Tre23, 194.pdf](2010/Des%20Wat%20Tre23,%20194.pdf)

Abstract: Crustacean shells contain high levels of chitin, a biopolymer that can be used to chelate metal ions. This study investigated the use of crustacean shells for chromium removal from tannery wastewater. Preliminary experiments aimed to determine whether chromium removal was due to adsorption by the carbohydrate’s chemical groups or to formation of insoluble chromium hydroxide due to the pH increase from addition of the polysaccharide to the wastewater. These experiments were performed using synthetic wastewater and commercial chitosan, a chemical compound obtained by chitin deacetylation. Subsequent experiments, carried out using tannery wastewater, were performed to determine whether chromium could be recovered from the sludge. Finally, different amounts of ground shrimp shells from fishery waste were used to remove chromium from tannery wastewater. The results showed that chromium removal was mediated primarily by adsorption and that chromium recovery from sludge was possible at very low pH. Ground shrimp shells removed chromium more effectively than commercial chitosan due to the combination of precipitation and adsorption processes.

Keywords: Adsorption, Adsorption, Ash, Chelate, Chemical, Chitin, Chitin, Chitosan, Chromium, Chromium Removal, Copper, Crustacean, Equilibrium, Experiments, Ion, Ions, Metal, Metal Ions, NOV, pH, Polysaccharide, Precipitation, Recovery, Removal, Sludge, Tanneries, Tannery Wastewater, Trivalent, Waste, Wastewater

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Full Text: [2010\Des Wat Tre23, 199.pdf](2010/Des%20Wat%20Tre23,%20199.pdf)

Abstract: Although activated sludge microbial communities are considered stable, the presence of toxic substances, such as Cr, in the influent may induce changes in the activity and the performance of a wastewater treatment plant. The main objective of this study was the determination of Cr effects on the performance and the protistan community of an activated sludge. Six laboratory scale activated sludge reactors, three conventional and three with PVA gel beads, were supplied with synthetic sewage containing Cr(VI), at three concentrations: 1, 5, and 10 mg l(-1). The protozoan species were identified, quantified, and correlated to each system’s efficiency through microscopic observations. Additionally, the extracellular polymeric substances (EPS) in the form of proteins and polysaccharides were determined. High removal rates of organic compounds (90%), ammonia-nitrogen (95%), total phosphorus (80%), and chromium (90%) were observed even at high Cr dosages. The abundance and diversity of the protistans were observed under all Cr loadings. Based on the composition of the protistan community, sludge biotic index (SBI) values decreased at the start of the operation but increased gradually with operation time. Chromium addition affected the relative protistan community by shifting from sessile to carnivorous species with an increase of influent chromium concentration.

Keywords: Activated Sludge, Ammonia Nitrogen, Bacteria, Beads, Behavior, Biocarrier, Biofilm, Biofilms, Biosorption, Biotic Index, Changes, Characteristics, Chromium, Chromium(VI), Community, Composition, Concentration, Conventional, Diversity, Efficiency, Extracellular Polymeric Substances, Extracellular Polymeric Substances (EPS), Gel, Granular Sludge, Index, Kinetics, Loadings, Microbial, Microfauna, NOV, Operation, Organic, Organic Compounds, Performance, Phosphorus, Plant, Polymeric, Polysaccharides, Polyvinyl Alcohol (PVA) Gel Bead, Proteins, Protistan, Rates, Removal, Scale, Sewage, Sludge, Sludge Biotic Index (SBI), Species, Stability, Total Phosphorus, Toxic, Toxic Substances, Treatment, Wastewater, Wastewater Treatment, Wastewater Treatment Plant

? Farhadi, K., Matin, A.A. and Hashemi, P. (2010), Removal of malachite green from aqueous solutions using molecularly imprinted polymer. *Desalination and Water Treatment*, **24** (1-3), 20-27.

Full Text: [2010\Des Wat Tre24, 20.pdf](2010/Des%20Wat%20Tre24,%2020.pdf)

Abstract: Efficiency of malachite green molecularly imprinted polymer (MGIP) as a selective adsorbent in removal of malachite green (MG) from aqueous solutions was evaluated by using the batch adsorption experiments. Adsorption kinetics and effects of various parameters such as solution pH, adsorbent dose and initial MG concentration were investigated. Under optimized conditions (adsorbent dose 20 mg, solution pH 7, contact time 5 min), equilibrium experimental data at 293, 303, and 313 K were represented by Freundlich and Langmuir isotherms and the thermodynamic parameters such as ΔGº, ΔHº, and ΔSº were also calculated. Results briefly show that adsorption of MG by MGIP obeys pseudo-second order lagergren kinetic model and Langmuir-1 isotherm. The capacity of proposed sorbent was determined as 303.03, 285.71 and 416.66 mg g-1 at 293, 303 and 313 K, respectively.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dose, Adsorption, Adsorption, Adsorption Kinetics, Aqueous Solutions, Ash, Basic-Dyes, Batch, Batch Adsorption, Capacity, Concentration, Data, Equilibrium, Equilibrium, Experimental, Experiments, Extraction, Freundlich, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherms, Malachite Green, Mg, Model, Molecularly Imprinted Polymer, pH, Polymer, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Recovery, Removal, Solution, Solutions, Sorbent, Sorption, Thermodynamic, Thermodynamic Parameters

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Full Text: [2010\Des Wat Tre24, 47.pdf](2010/Des%20Wat%20Tre24,%2047.pdf)

Abstract: The adsorption of 2,4,5-trichlorophenol (2,4,5-TCP) from aqueous solutions onto the crude bentonite modified with hexadecyltrimethylammonium-bromide (HDTMAB) have been studied. The parameters that affect the 2,4,5-TCP adsorption onto modified bentonite (BHDTMA), such as contact time, solution pH, and temperature have been investigated and optimized conditions determined. Three kinetic models have been evaluated in order to attempt to fit the experimental data, namely the pseudo-first order, the pseudo-second-order and the intraparticle model. The results show that the pseudo-second-order kinetic model generates the best agreement with the experimental data for the adsorption system. Adsorption equilibrium data of 2,4,5-TCP on BHDTMA were analyzed by Langmuir, Freundlich and Langmuir-Freundlich isotherm models. The results indicate that the Langmuir-Freundlich model provides the best correlation of experimental data. The maximum capacity of BHDTMA at 293 K was founded around 72 mg/g. The thermodynamic parameters such as a free energy, enthalpy and entropy of adsorption was calculated. The negative values of ΔGº and ΔHº indicate the spontaneous and exothermic nature of the process.

Keywords: 2,4,5-Trichlorophenol, 2,4-Dichlorophenol, Activated Carbon, Adsorption, Adsorption Equilibrium, Aqueous Solutions, Aqueous-Solutions, Bentonite, Benzene, Capacity, Correlation, Data, Energy, Enthalpy, Entropy, Equilibrium, Exothermic, Experimental, Freundlich, Isotherm, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Langmuir-Freundlich, Langmuir-Freundlich Isotherm, Model, Models, Modified, Montmorillonite, Organophilic-Bentonite, pH, Phenol, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Solution, Solutions, Sorption, Surfactant Modified Zeolite, Temperature, Thermodynamic, Thermodynamic Parameters, Waste-Water

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Full Text: [2010\Des Wat Tre24, 55.pdf](2010/Des%20Wat%20Tre24,%2055.pdf)

Abstract: The precipitation of strontium sulfate in 0.7 mol l(-1) sodium chloride solutions was investigated at various degrees of supersaturation (0.2-0.62), with pH = 7.5, at 25 degrees C. The rate of precipitation showed a quadratic dependence upon the relative degree of supersaturation which suggests a surface-controlled mechanism. The presence of phosphonates even at relatively low concentrations (2.5-20 x 10(-6) mol l(-1)) was retarding the rate of precipitation. This retardation effect was enhanced with the increase in concentration of the additives. Moreover, the retardation further augmented as the relative degree of supersaturation was decreased. The effect of the additives has been attributed to the blocking of active sites by adsorption of the additive molecules on the crystal precipitation surfaces. The action of the additives can be interpreted in terms of a Langmuir-type adsorption isotherm.

Keywords: Additives, Adsorption, Adsorption Isotherm, Aqueous Solutions, Barium-Sulfate, Chloride, Chloride Solutions, Concentration, Crystal-Growth, Crystallization, Dissolution, Gypsum, Inhibitors, Isotherm, Kinetics, Mechanism, pH, Polyphosphonate, Precipitation, Sodium, Sodium Chloride, Solutions, Strontium, Strontium Sulfate, Sulfate, Surfaces

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Full Text: [2010\Des Wat Tre24, 61.pdf](2010/Des%20Wat%20Tre24,%2061.pdf)

Abstract: The adsorption of methylene blue from aqueous solution onto clinoptilolite has been studied under various experimental conditions. Heat treatment and acid treatment have also been applied to modify the clinoptilolite. It is found that heat treatment and acid treatment can significantly change the adsorption capacity. The treatment of clinoplites has the higher adsorption capacity than untreated ones. The adsorption data have been analyzed using Langmuir and Frendlich isotherms. The results indicate that the Langmuir model provides the better correlation of the experimental data. Isotherms have also been used to obtain the thermodynamic parameters such as free energy, enthalpy and entropy of adsorption. For heat treatment of clinoptilolite, adsorption of methylene blue is endothermic reaction with Delta H-ads at 50.67 kJ/mol.

Keywords: Acid Treatment, Acid-Treatment, Adsorption, Adsorption, Adsorption Capacity, Agricultural Waste, Aqueous Solution, Aqueous-Solutions, Bottom Ash, Capacity, Carbon Slurry, Clinoptilolite, Correlation, Data, Endothermic, Energy, Enthalpy, Entropy, Experimental, Fly-Ash, Heat-Treatment, Isotherms, Langmuir, Langmuir Model, Low-Cost Adsorbents, Methylene Blue, Model, Modify, Reactive Azo Dyes, Red Mud, Removal, Rhodamine-B, Solution, Thermodynamic, Thermodynamic Parameters, Treatment

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Full Text: [2010\Des Wat Tre24, 74.pdf](2010/Des%20Wat%20Tre24,%2074.pdf)

Abstract: This research paper deals with the use of low-cost, easy obtained, high efficiency and eco-friendly adsorbents as an ideal alternative to the current expensive methods of removing dyes from wastewater. This study investigates the potential use of Neem bark powder (NBP) for the removal of Indigo Carmine (I.C) and Methylene Blue (M.B) dyes from simulated wastewater. The effects of different system variables, adsorbent dosage, initial dye concentration, pH and contact time were studied. The results showed that as the amount of the adsorbent increased, the percentage of dye removal increased accordingly. Optimum pH value for dye adsorption was different according to the nature of the dyes. The adsorption of both the dyes was found to be a pseudo-second-order rate equation and fit well with Langmuir equation, better than Freundlich equation. The maximum removal of I.C was obtained at pH 2 and M.B at pH 10. The maximum adsorption capacity obtained from Langmuir equation was 4.02 x 103 and 3.11 x 103 mol g-1 for I.C and M.B on NBP. Furthermore, adsorption kinetics of I.C and M.B were studied and the rate of adsorption was found to conform to pseudo-second-order kinetics with a good correlation (R-2 > 0.99) with intraparticle diffusion as one of the rate determining steps. Thus low-cost NBP can be an attractive option for dyes removal from diluted industrial effluents.

Keywords: Activated Carbons, Adsorbent, Adsorbent Dosage, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Kinetics, Alternative, Aqueous-Solution, Capacity, Cationic Dye, Concentration, Correlation, Diffusion, Dye, Dye Adsorption, Dye Removal, Dyes, Efficiency, Effluents, Equilibrium, Freundlich, Freundlich Equation, Industry Waste, Intraparticle Diffusion, Kinetics, Kinetics, Langmuir, Langmuir Equation, Low Cost, Low-Cost Biosorbent, Metal-Ions, Methods, Methylene Blue, Neem, Neem Bark Powder, pH, pH Value, Potential, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Pseudo-Second-Order Rate, Removal, Research, Thermodynamics, Value, Waste-Water, Wastewater

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Full Text: [2010\Des Wat Tre24, 93.pdf](2010/Des%20Wat%20Tre24,%2093.pdf)

Abstract: Natural organic matter (NOM) normally exists in raw surface water as a complex mixture of organic compounds, mainly humic acids and fulvic acids. In water treatment plants, free chlorine reacts with NOM and forms a wide range of substances known as disinfection byproducts (DBPs). Granular activated carbon (GAC) adsorption is one of the best available technologies employed for the removal of NOM. Mathematical models for the adsorption of NOM onto GAC in a fixed bed column were reviewed. These models were solved numerically using finite element and orthogonal collocation methods. Of all the tested models, best agreement was obtained between predicted values using homogenous surface diffusion model (HSDM), incorporating adjustment of the average particle size with a proper value of sphericity factor, and experimental results conducted using rapid small scale column tests (RSSCT) for a range of empty bed contact times (EBCT), GAC particle size, and raw water pH. Most of the model parameters were determined experimentally in adsorption equilibrium isotherm and batch reactor experiments.

Keywords: Activated Carbon, Adsorption, Adsorption Equilibrium, Application, Batch, Batch Reactor, Beds, Carbon, Chlorine, Column, Column Tests, Design, Diffusion, Diffusion Model, Disinfection, Doc, Drinking-Water, Equilibrium, Equilibrium Isotherm, Experimental, Experiments, Finite Element, Fixed Bed, Forms, Gac, Granular Activated Carbon, Hsdm, Humic Acids, Isotherm, Methods, Model, Models, Natural, Nom, Organic, Organic Compounds, Organic Matter, Particle Size, pH, Plants, Removal, Rssct, Scale, Simulation, Size, Small, Surface, Surface Diffusion, Surface Water, Systems, Technologies, Treatment, Value, Water, Water Treatment, Water-Treatment

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Full Text: [2010\Des Wat Tre24, 109.pdf](2010/Des%20Wat%20Tre24,%20109.pdf)

Abstract: Ion exchange technology is currently the best way to remove nitrate from drinking water. A commercial resin was tested to examine the effectiveness of adsorption for nitrate removal; the resin is Amberlite IRA 400, since it is considered the most promising owing to its chemical stability and ability to control surface chemistry. KNO3 solution (22.15 mg L-1) was used in batch adsorption experiments. Adsorbent dosages were varied from 0.875 to 5 g L-1. An increase in adsorbent dosage increased the percent removal of nitrate. The retention was initially very fast and maximum retention was observed within 30 min of agitation. Two simplified kinetic models were considered to investigate the ion exchange mechanisms, i.e. the liquid film diffusion and the intraparticle diffusion models, and it was shown that the former controlled the beginning of the process while the latter predominated at the end of the process.

Keywords: Acid, Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorption, Agitation, Aqueous-Solutions, Batch, Batch Adsorption, Chemical, Chemistry, Chitosan, Control, Diffusion, Drinking Water, Effectiveness, Experiments, Film Diffusion, Intraparticle Diffusion, Ion Exchange, Ion Exchange Resin, Ion-Exchange, Ion-Exchange Resins, Kinetic, Kinetic Models, L1, Liquid, Mechanisms, Models, Nitrate, Nitrate Removal, Powder, Removal, Removal of Nitrate, Resin, Retention, Solution, Sorption, Stability, Surface, Surface Chemistry, Technology, Water

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Full Text: [2010\Des Wat Tre24, 202.pdf](2010/Des%20Wat%20Tre24,%20202.pdf)

Abstract: Manganese is frequently present at elevated concentrations in both surface and groundwater. In addition, manganese is a health hazard, highly soluble over a wide pH range and difficult to remove from the contaminated waters. It was observed that during the interaction of Mg-enriched kaolinite-bentonite ceramics (2 wt% of Mg and Al surplus each) prepared in this work, with manganese aqueous solutions (530 mu g L-1 -530 mg L-1 of Mn(II)) the manganese concentration decreases. It appears that these changes of metal concentration are on account of manganese deposition on the ceramics surface. The interaction of the ceramic samples prepared at 800 degrees C with the manganese aqueous solutions for 24 h reduced manganese concentration up to 80%.

Keywords: Adsorption, Aqueous Solutions, Changes, Concentration, Deposition, Groundwater, Hazard, Health, Heavy-Metal Removal, Impregnated Activated Carbon, Interaction, Ions, Iron, L1, Magnesium, Manganese, Manganese Aqueous Solution, Manganese Removal From Water, Metal, Mg-Enriched Aluminium Silicate Ceramics, Mine Drainage, pH, Removal, Solutions, Surface, Systems, Water, Waters, Work

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Full Text: [2010\Des Wat Tre24, 210.pdf](2010/Des%20Wat%20Tre24,%20210.pdf)

Abstract: A series of phosphazene heteropolymers (NP (OC6H4C3H5)(x)(OC6H5)(y)(OCH2CF3)(z))(n)) with different percentages of 2,2,2-trifluoroethoxy groups were synthesized and found to have a high affinity for VOCs through pervaporation experiments and sorption studies. The pervaporation performance of as-prepared membranes for removal of tetrahydrofuran, acetone and ethanol from water was characterized, in order to study the effect of 2,2,2-trifluoroethoxy pendant group on pervaporation performance. The membranes had better selectivity for THF/water and acetone/water (maximum 30.2 and 24.1, respectively) compared with a polydimethylsiloxane membrane. As the content of 2,2,2-trifluoroethoxy group increased, both selectivity and flux was increased for ethanol/water. However, selectivity for THF/water and acetone/water was decreased. The swelling and sorption experiments of polymers, solubility parameter and diffusivity analysis provide insight into the process.

Keywords: 2,2,2-Trifluoroethoxy, Acetone, Analysis, Aqueous Solutions, Behavior, Diffusion, Ethanol, Ethanol-Water Mixtures, Experiments, High-Flux, Membrane, Organic, Organic Compounds, Pdms, Performance, Permeation, Pervaporation, Pervaporation Performance, Poly(Dimethylsiloxane), Polyimide Membranes, Polymers, Polyphosphazene, Removal, Selectivity, Separation, Solubility, Solutions, Sorption, Sorption Studies, Swelling, Vapors, VOCs, Water

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Full Text: [2010\Des Wat Tre24, 278.pdf](2010/Des%20Wat%20Tre24,%20278.pdf)

Abstract: In submerged membrane system, membrane fouling is linked to the reversible accumulation of macromolecules and solids on the membrane surface and the irreversible sorption of soluble molecules inside the pores. In the first part of the paper, the fouling was analysed at two different aeration rates through the determination of membrane resistance due to (a) sludging (R-sludging), (b) irreversible biofilm (R-biofilm) and (c) adsorption of organic (R-adsorption). These results confirm the importance of aeration for sludge control in the bundle. In the second part of the paper, irreversible foulant obtained at different aeration rates were characterised. Membrane air flow rate limits adsorption of biopolymers onto or into the membrane surface.

Keywords: Accumulation, Adsorption, Aeration, Air, Biofilm, Biopolymers, Bioreactor, Control, Effluent, First, Flow, Flow Rate, Fouling, Fractions, Impact, Membrane, Membrane Fouling, Membrane Reactor, Organic, Permeability, Quantification, Rates, Resistance, Sludge, Sorption, Submerged Membrane Bioreactors, Surface, Ultrafiltration, Waste-Water Treatment

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Full Text: [2010\Des Wat Tre24, 284.pdf](2010/Des%20Wat%20Tre24,%20284.pdf)

Abstract: The objective of this work is to compare the removal of cadmium(II) by the natural bentonite and composite, prepared by magnetic modification of the clay. Both, the bentonite and the composite material were characterized with the aim to describe their structural and surface properties by the X-ray diffraction, FE-TEM method and low nitrogen adsorption method. The surface charge of the materials was studied by the zeta potential measurement. The sorption properties were examined under the different conditions such as pH of the model solutions, contact time and initial metal ion concentration. The optimal pH for the removal of cadmium (II) was found equal 5. The equilibrium data was analyzed using the linearized Langmuir isotherm. The maximum adsorption capacities obtained from the sorption experiments realized in initial concentration range 10-750 mg L-1 were 61.35 and 63.29 mg g-1 for the bentonite and composite, respectively. Refining the initial metal concentration range to 1-10 mg L-1, the sorption efficiency of composite achieved more than 98%.

Keywords: Adsorbent, Adsorption, Adsorption Behavior, Adsorption Capacities, Aqueous Solution, Bentonite, Cadmium, Cadmium (II), Charge, Clay, Composite, Composite Material, Concentration, Contaminants, Data, Efficiency, Equilibrium, Experiments, Heavy-Metals, Isotherm, L1, Langmuir, Langmuir Isotherm, Magnetic, Measurement, Metal, Model, Modification, Montmorillonite, Natural, Natural Bentonite, Nitrogen, pH, Potential, Recommendations, Removal, Solution, Solutions, Sorption, Sorption Properties, Sulfuric-Acid, Surface, Surface Charge, Surface Properties, Waste-Water, Work, X-Ray, X-Ray Diffraction, Zeta Potential

? Turk, T., Alp, I. and Deveci, H. (2010), Adsorptive removal of arsenite from water using nanomagnetite. *Desalination and Water Treatment*, **24** (1-3), 302-307.

Full Text: [2010\Des Wat Tre24, 302.pdf](2010/Des%20Wat%20Tre24,%20302.pdf)

Abstract: This paper describes a study of the sorptive removal of arsenite (As(III)) from aqueous solutions by commercial nanomagnetite (NM). We also investigated the adsorption mechanism of arsenite (As(III)) onto the NM. The influences of solution pH, initial arsenite (As(III)) concentration and sorbent concentration were investigated in multiple kinetic runs. The adsorption rates and isotherms were investigated in batch experiments. We evaluated fits to the experimental data of the pseudo-first-order and pseudo-second-order kinetic models and determined that our system was best described by the second-order model. Langmuir and Freundlich isotherms were used to fit the adsorption data from equilibrium experiments. According to results of As removal measurements, NM has a high arsenite removal efficiency, with the ability to reduce the concentration of arsenite in the aqueous solution from an initial value of 300 to <5 mu g/L.

Keywords: Adsorption, Adsorption Mechanism, Aqueous Solution, Aqueous Solutions, Aqueous-Solutions, Arsenite, Arsenite Removal, Batch, Batch Experiments, Cement, Commercial Nanomagnetite, Concentration, Data, Efficiency, Equilibrium, Experimental, Experiments, Freundlich, Groundwaters, Isotherm, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir and Freundlich Isotherms, Mechanism, Model, Models, Nm, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Rates, Red, Removal, Removal Efficiency, Second Order, Second-Order, Second-Order Model, Size, Solution, Solutions, Sorbent, System, Value, Water

? Nourouzi, M.M., Chuah, T.G. and Choong, T.S.Y. (2010), Adsorption of glyphosate onto activated carbon derived from waste newspaper. *Desalination and Water Treatment*, **24** (1-3), 321-326.

Full Text: [2010\Des Wat Tre24, 321.pdf](2010/Des%20Wat%20Tre24,%20321.pdf)

Abstract: This paper investigates the ability of activated carbon derived from waste newspaper (WNAC) to remove pesticide glyphosate from aqueous solution. The influence of initial pH was first studied. It was found that the WNAC presented the highest uptake capacity at pH 2.5. Adsorption isotherm models such as Langmuir, Freundlich and Redlich-Peterson were used to describe the adsorption of glyphosate by WNAC. The results show that the Langmuir adsorption isotherm model best fits the experimental data. The maximum adsorption capacity of WNAC is found to be 48.4 mg/g.

Keywords: Acid, Activated Carbon, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherm Model, Aqueous Solution, Ash, Capacity, Carbon, Data, Experimental, First, Freundlich, Glyphosate, Isotherm, Isotherm Model, Isotherm Models, Langmuir, Langmuir Adsorption Isotherm, Model, Models, Oil Palm, Paper, Pesticide, Pesticides, pH, Phosphate, Redlich-Peterson, Removal, Sludge, Solution, Uptake, Waste, Waste Newspaper Activated Carbon, Water

? AL-Ghezawi, N., Al-Anber, M.A., Al-Anber, Z.A., El-Hasan, T. and Al-Momani, I. (2010), Decontamination and adsorption modelling of aqueous Pb2+ and Co2+ ions using natural inorganic materials: Tripoli (NT) and bentonite (NB). *Desalination and Water Treatment*, **24** (1-3), 336-343.

Full Text: 2010\Des Wat Tre24, 336.pdf

Abstract: Decontamination and adsorption modelling of Co2+ and Pb2+ ions from a model aqueous solution have been studied in batch system using natural tripoli (NT) and bentonite (NB). The adsorption study is controlled by a number of factors such as adsorbent dosage, contact time, initial metal ion concentration, and temperature effect. The adsorption equilibrium is achieved during the first 60 min. The maximum removal 97% (approx.) is obtained at 10 g/L and 20ºC. The dynamic isotherm has been successfully modelled by the Langmuir (R-2 = 0.98). The negative thermodynamic parameter ΔG indicates for the spontaneous adsorption. The pseudo-second-order kinetic model has much more reasonable for metal ions adsorption process (R-2 = 1.0 approx.).

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Equilibrium, Adsorption Modeling, Adsorption Modelling, Aqueous Solution, Batch, Batch System, Bentonite, Co2+, Cobalt, Concentration, Copper, Dynamic, Equilibrium, First, Fulvic-Acid, Heavy-Metal Ions, Ions, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Lead, Metal, Metal Ions, Model, Modelling, MX-80 Bentonite, Natural, Pb(II), Pb2+, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Solution, Sorption, Strength, Temperature, Temperature Effect, Thermodynamic, Thermodynamic Parameter, Tripoli

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Full Text: 2010\Des Wat Tre24, 344.pdf

Abstract: The biosorption of Pb(II), Cd(II), and Hg(II) from simulated aqueous solutions using baker’s yeast biomass was investigated. Batch type experiments were carried out to find the equilibrium isotherm data for each component (single, binary, and ternary), and the adsorption rate constants. Kinetics pseudo-first and second-order rate models applied to the adsorption data to estimate the rate constant for each solute, the results showed that the Cd(II), Pb(II), and Hg(II) uptake process followed the pseudo-second-order rate model with (R-2) 0.963, 0.979, and 0.960, respectively. The equilibrium isotherm data were fitted with five theoretical models. Langmuir model provides the best fitting for the experimental results with (R-2) 0.992, 0.9987, and 0.9995 for Cd(II), Pb(II), and Hg(II), respectively. The effect of various influent adsorbates concentration, and flow rate on the performance of fixed bed adsorber was found for the three heavy metals. A mathematical model was formulated to describe the breakthrough curves in the fixed bed adsorber for each component. The results show that the mathematical model provides a good description of the adsorption process for Cd(II), Pb(II), and Hg(II) onto fixed bed of baker’s yeast biomass.

Keywords: Activated Carbon, Adsorption, Adsorption Rate, Aqueous Solutions, Aqueous-Solution, Baker’s Yeast, Bakers-Yeast, Biomass, Biosorption, Breakthrough, Breakthrough Curves, Cadmium, Cd, Cd(II), Concentration, Cu2+, Data, Equilibrium, Equilibrium Isotherm, Experimental, Experiments, Fixed Bed, Fixed Bed Adsorber, Fixed-Bed, Flow, Flow Rate, Heavy Metals, Hg(II), Ions, Isotherm, Kinetics, Langmuir, Langmuir Model, Lead, Mass Transfer Coefficient, Mathematical Model, Mercury, Metals, Model, Models, Pb, Pb(II), Performance, Pseudo Second Order, Pseudo-First and, Pseudo-Second-Order, Pseudo-Second-Order Rate, Rate Constant, Rate Constants, Removal, Second Order, Second-Order, Solutions, Theoretical Models, Uptake, Waste, Water, Yeast

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Full Text: [2011\Des Wat Tre25, 1.pdf](2011/Des%20Wat%20Tre25,%201.pdf); [2011\Des Wat Tre-Tanaka.pdf](2011/Des%20Wat%20Tre-Tanaka.pdf)

Abstract: This study was designed to evaluate the global scientific output of desalination research to assess the characteristics of the research tendencies and the research performances. Data were based on the online version of Science Citation Index, Web of Science from 1991 to 2008. Two main respects of the paper characteristics, performance of publication and research tendency, were analyzed. Performances of publications were assessed including document type, language, subject categories, journals, institutes, and countries. Research tendency was investigated by statistically analyzing the distribution of word in article title, author keyword, and keyword plus in different periods. Results show the desalination research mainly performed on subject category of chemical engineering. More specific, research might focus on membranes related research.

Keywords: Bibliometric, Bibliometric Analysis, Cellulose Acetate, Characteristics, Chemical, Chemical Engineering, Continuous Fractional Distillation, Desalination, Distribution, Engineering, Journals, Membrane Desalination, Nanofiltration Membranes, Of-The-Art, Performance, Publication, Publications, Research, Reverse Osmosis, Reverse-Osmosis, Science Citation Index, Scientific Output, Sea-Water, Seawater Desalination, Solar Distillation, Solar Energy, Trends, Version, Water-Vapor Distillation, Web of Science

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Full Text: [2011\Des Wat Tre25, 25.pdf](2011/Des%20Wat%20Tre25,%2025.pdf)

Abstract: The use of anion-cation organobentonite for the treatment of wastewater generated during a textile dyeing and printing process was studied. It was found that the color removal of the organobentonite was higher than that of the natural bentonite. The maximum color removal was obtained by the anion-cation organobentonite with the mass ratio 4:1 of cetyl trimethyl ammonium bromide (cation) to sodium dodecyl sulfate (anion). The concentrations of target constituents, such as chemical oxygen demand (COD) and suspended solids (SS), in the wastewater post-treated by using this organobentonite were determined and summarized. In addition, the pseudo-first-order and pseudo-second-order kinetic equations were rearranged to expediently investigate the adsorption process. The results show that the color removal of the wastewater treated by the organobentonite followed the pseudo-first-order model.

Keywords: Acid Dye, Adsorbents, Adsorption, Ammonium, Anion-Cation Organobentonite, Aqueous-Solutions, Basic Dye, Behavior, Bentonite, Bromide, Cation, Chemical, Chemical Oxygen Demand, Cod, Color Removal, Demand, Kinetic, Kinetic Equations, Kinetic Model, Model, Modified, Natural, Organobentonite, Oxygen, Printing, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Removal, Rhodamine-B, Sodium, Sodium Dodecyl Sulfate, Sorption, SS, Sulfate, Suspended Solids, Textile Wastewater, Treatment, Wastewater

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Full Text: [2011\Des Wat Tre25, 47.pdf](2011/Des%20Wat%20Tre25,%2047.pdf)

Abstract: Studies were performed to determine the effectiveness of hybrid system combining ion exchange and ultrafiltration for surfactant separation from water solutions. During the experiments the influence of membrane cut-off, type of ion-exchange resin, resin dose and contact time was evaluated. The results obtained for the hybrid system were also compared with the effectiveness of the single processes, i.e. ultrafiltration and ion exchange. It was found that the combination of ion exchange and ultrafiltration was more effective in surfactant removal than ultrafiltration process alone. In the hybrid system because of the resin presence, the systematic increase in surfactant separation along with the filtration time was noticed. From among the ion-exchange resins tested the most effective was MIEX (R) one. For the smallest resin dose equal to 5 cm(3)/dm(3) the reduction of anionic surfactants from model solution with concentration of 0.25 CMC reached almost 100% for the hybrid process with 30 kDa polyethersulfone membrane. The retention coefficient of anionic surfactant achieved by the ion-exchange-ultrafiltration system with A100 and A200 resins was lower and amounted to 47% and 94% after 60 min of the process, respectively.

Keywords: Adsorption, Anionic Surfactant, Behavior, Cmc, Concentration, Detergent, Effectiveness, Experiments, Filtration, Hybrid, Hybrid Process, Ion Exchange, Ion Exchange Resin, Ion Exchange Resins, Ion-Exchange, Ion-Exchange Resin, Ionexchange, Membrane, Model, Reduction, Removal, Resin, Resins, Retention, Separation, Solution, Solutions, Surfactant, Surfactants, Ultrafiltration, Water

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Full Text: [2011\Des Wat Tre25, 54.pdf](2011/Des%20Wat%20Tre25,%2054.pdf)

Abstract: The sorption of reactive dyes Red Procion HE-7B (RP) and Yellow Procion H-4R (YP) on raw Luffa cylindrica was examined. Characterization of the sorbent was made by its infrared analysis and also by SEM analysis. The effect of a number of experimental parameters such as sorbent amount, contact time, pH of the dye solution, dye concentration and temperature was evaluated by using the batch technique. The best pH conditions for sorption and desorption are 2.5 and 12. The sorption followed the Langmuir isotherm model, and increasing temperature resulted in increased sorption capacity. Kinetic studies were also carried out and specific rate constants were calculated. Dye sorption experimental data were well fitted to the pseudo second-order kinetic model, and the intraparticle diffusion was also significant. The sorption capacity - 12.2 and 13.9 mg/g for YP and RP, respectively, at 22ºC - indicated that this sorbent can be effective for reactive dyes removal. Fixed bed column experiments were also performed and breakthrough curves were obtained. Cycles of sorption/desorption showed a distinct behavior for the dyes; the desorption efficiency of YP increased, achieving 97-98% in the 3rd cycle.

Keywords: Adsorbents, Adsorption, Analysis, Aqueous-Solution, Batch, Behavior, Biosorption, Breakthrough, Breakthrough Curves, Capacity, Case Study, Characterization, Column, Column Experiments, Concentration, Data, Desorption, Diffusion, Dye, Dyes, Efficiency, Effluent, Equilibrium, Experimental, Experiments, Fixed Bed, Fly-Ash, Intraparticle Diffusion, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Low Cost, *Luffa cylindrica*, Model, pH, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Rate Constants, Reactive Dye, Reactive Dyes, Recovery, Removal, Second Order, Second-Order, SEM, Solution, Sorbent, Sorbents, Sorption, Sorption Capacity, Sorption, Desorption, Temperature, Waste-Water

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Full Text: [2011\Des Wat Tre25, 78.pdf](2011/Des%20Wat%20Tre25,%2078.pdf)

Abstract: The loading of anion exchange resins with humic compounds adsorbed during industrial water treatment processes has been investigated. It has been found that humic compounds are uniformly distributed throughout the bead. Fresh and exhausted anion exchange resins have been studied with respect to their ability to be loaded with Fe(III) oxides. The results show that anion exchangers containing humic compounds retain iron better than fresh ones. The uptake may be due to catalytic oxidation and contact coagulation at the surface.

Keywords: Anion Exchange Resins, Catalytic Oxidation, Coagulation, Distributed, Exhausted Resins, Fe(III), Humic Compounds, Ion-Exchange, Iron, Iron Sorption, Loading, Natural Organic-Matter, Oxidation, Oxides, Removal, Resins, Surface, Treatment, Uptake, Water, Water Treatment

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Full Text: [2011\Des Wat Tre25, 98.pdf](2011/Des%20Wat%20Tre25,%2098.pdf); [2011\Des Wat Tre-Zhang.pdf](2011/Des%20Wat%20Tre-Zhang.pdf)

Abstract: Soil has been widely used in many wastewater treatment systems, and proved to be an effective substrate for phosphorus removal and retention. It is significant to study its adsorption characteristics by using appropriate theoretical models. In this study, laterite (or red soil) was selected as an example to investigate the adsorption characteristic of phosphorus onto soil with the Langmuir, Freundlich, and Redlich-Peterson isotherms by both the linear and non-linear regression methods. The adsorption experiment was conducted at the temperatures of 283, 288, 298, and 308 K, respectively, to choose the appropriate method and obtain the credible adsorption parameters for soil adsorption equilibrium studies. The results showed that the non-linear regression method would be a better way to compare the better fit of isotherms for the adsorption of phosphorus onto laterite. Both the two-parameter Freundlich and the three-parameter Redlich-Peterson isotherms had higher coefficients of determination for the adsorption of phosphorus onto laterite at various temperatures. In addition, a relationship between Freundlich isotherm parameters and Redlich-Peterson isotherm parameters was presented.

Keywords: Adsorption, Adsorption Equilibrium, Aqueous-Solution, Characteristics, Constructed Wetlands, Equilibrium, Equilibrium Studies, Experiment, Freundlich, Freundlich Isotherm, Isotherm, Isotherm Parameters, Isotherms, Langmuir, Laterite, Lead, Methods, Models, Non-Linear Regression, Nonlinear Regression, Phosphorus, Red Soil, Redlich-Peterson, Regression, Removal, Retention, Soil, Soil Adsorption, Sorption Isotherm, Systems, Temperature, Theoretical Models, Treatment, Wastewater, Wastewater Treatment

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Full Text: [2011\Des Wat Tre25, 159.pdf](2011/Des%20Wat%20Tre25,%20159.pdf)

Abstract: A novel biosorbent, chitosan coated calcium alginate (CCCA), was developed by coating chitosan, a naturally and abundantly available cationic biopolymer, onto an anionic biopolymer calcium alginate for the removal of fluoride ion from aqueous solutions. The results were compared with calcium alginate (CA) beads obtained from natural biopolymer sodium alginate. Further the biosorbents were characterized by FTIR, SEM and TGA techniques and surface area analysis. Defluoridation of water was studied by using the biosorbent under batch equilibrium and column flow experimental conditions. The effect of various process parameters such as pH, contact time, concentration of fluoride and amount of biosorbent was investigated in order to optimize the process. The equilibrium data were used to study the kinetics of defluoridation process such as pseudo first order, pseudo-second order and Weber-Morris intraparticle diffusion models. The data were fitted to Langmuir and Freundlich adsorption isotherms. The column flow adsorption data were utilized to obtain break through curves. The maximum monolayer adsorption of fluoride on CA and CCCA were found to be 29.3 and 42.0 mg/g. The experimental results demonstrated that chitosan coated calcium alginate beads could be used for the defluoridation of drinking water.

Keywords: Adsorption, Adsorption, Adsorption Isotherms, Alginate, Analysis, Aqueous Solutions, Batch, Beads, Biosorbent, Biosorbents, Brackish-Water, Calcium, Calcium Alginate, Characterization, Chitosan, Coated, Coating, Column, Concentration, Data, Defluoridation, Defluoridation, Diffusion, Drinking Water, Drinking-Water, Electrodialysis, Equilibrium, Experimental, First, First Order, Flow, Fluoride, Fluoride Ion, Fluorosis, Freundlich, Ftir, Intraparticle Diffusion, Isotherms, Kinetics, Langmuir, Low-Cost Materials, Models, Monolayer, Natural, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, SEM, Sodium, Solutions, Sorbent, Sorption, Surface, Surface Area, Techniques, TGA, Water

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Full Text: [2011\Des Wat Tre25, 170.pdf](2011/Des%20Wat%20Tre25,%20170.pdf)

Abstract: In this paper, a novel process of recycling alum sludge with powdered active carbon (PAC) was evaluated for drinking water treatment under various conditions. Results of this study indicated that the removal of turbidity, DOC and UV254 from simulated raw water by recycling alum sludge with PAC could reach up to 89.2%, 52.7% and 60.1%, respectively, which were better than that of recycling alum sludge alone, and it may be due to the adsorption of PAC which existed in mixed sludge. Turbidity of raw water had an important impact on the recycle of alum sludge with the PAC process, which is better to be applied in treating raw water with turbidity less than 100 NTU. In addition, the optimal pH for humic acid removal by recycling alum sludge with PAC was approximately 5. It was postulated that combination of adsorption and sweeping by hydroxide precipitates and the adsorption of PAC existing in mixed sludge played a key role in the enhancement of turbidity and organic matter removal.

Keywords: Active Carbon, Adsorption, Alum, Alum Sludge, Carbon, Coagulation, DOC, Drinking Water, Drinking Water Treatment, Humic Acid, Impact, Organic, Organic Matter, Organic Matters Removal, PAC, pH, Precipitates, Recycle, Recycling, Removal, Role, Sludge, Treatment, Turbidity, Water, Water Treatment

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Full Text: [2011\Des Wat Tre25, 176.pdf](2011/Des%20Wat%20Tre25,%20176.pdf)

Abstract: The mutual action of Cu(II) and nonionic surfactant Lutensol AO-10 on their sorption onto neutral hyper-cross-linked polystyrene Macronet MN-200 from mixtures has been investigated by the analysis of sorption equilibrium and kinetic data. The experimental equilibrium data were analyzed using the Langmuir and Freundlich models. The sorption mechanism of Cu(II) from one-component solutions or Cu(II) and AO-10 from their mixture corresponded to the Langmuir model rather than to the Freundlich one, whereas the sorption mechanism of AO-10 from one-component solutions proceeded according to the Freundlich rather than to the Langmuir model. The pseudo-second-order- reaction and intraparticle diffusion models (Weber-Morris plot) were used to describe the sorption kinetics, and to determine the sorption rate (k(2)), intraparticle (k(i)) and external diffusion (k(s)) constants. The k(2) values obtained for Cu(II) sorption from solutions free from AO-10 was higher than those obtained for sorption from solutions free from Cu(II). The presence of AO-10 in the mixture results in a decrease in k(2) value for Cu(II), whereas the presence of Cu(II) leads to an increase in k(2) value determined for AO-10. The Cu(II) sorption rates from the solution free from AO-10 or Cu(II) and AO-10 from their mixture are dependent on intraparticle and external diffusion proceeding simultaneously. The sorption rate of AO-10 from one-component solution is limited only by intraparticle diffusion. Electron microscopy (SEM) images of MN 200 surface, scanned before and after AO-10 sorption, distribution of Cu(II) in the cross-section of the bead after Cu(II) sorption in the presence of AO-10 are in agreement with sorption measurements.

Keywords: Activated Carbon, Adsorbent, Adsorption, Analysis, Chromatography, Copper, Copper(II), Cu(II), Data, Diffusion, Distribution, Dye, Environment Protection, Equilibrium, Experimental, Fly-Ash, Freundlich, Humic-Acid, Hyper-Cross-Linked Polystyrene, Hypercrosslinked Polystyrene, Intraparticle Diffusion, Kinetic, Kinetics, Langmuir, Langmuir Model, Mechanism, Mn, Mn200, Model, Models, Nonionic Surfactant, Performance, Polystyrene, Pseudo Second Order, Rates, Removal, SEM, Solution, Solutions, Sorption, Sorption, Sorption Kinetics, Sorption Mechanism, Surface, Surfactant, Value

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Full Text: [2011\Des Wat Tre25, 187.pdf](2011/Des%20Wat%20Tre25,%20187.pdf)

Abstract: In this study, removal of Disperse Red 1 from an aqueous solution by biosorption on dead fungus, *Aspergillus niger* was investigated. Effective pretreatment for increasing the biosorption capacity was studied by using different pretreatment methods. Among them, NaOH pretreatment was the most effective. The effective initial pH for the maximum dye adsorption by fungal biomass was 4.0. Kinetic studies showed that the biosorption of Disperse Red 1 on fungal biomass was a slow process and the binding between fungal biomass and the molecules of Disperse Red 1 was weak in the initial period. Equilibrium was reached in 48 h. Isotherm studies showed that the Redlich-Peterson isotherm model could describe the experimental data with a low correlation coefficient. This study demonstrated that dead fungal biomass of A. niger was only moderately effective in removing Disperse Red 1 from an aqueous solution.

Keywords: Adsorption, Aqueous Solution, *Aspergillus niger*, Binding, Biomass, Biosorption, Biosorption, Capacity, Carbon, Correlation, Correlation Coefficient, Data, Disperse Red 1, Dye, Dye Adsorption, Equilibrium, Experimental, Fungal Biomass, Fungus, Isotherm, Isotherm Model, Kinetic, Kinetic Studies, Methods, Model, Naoh, pH, Pretreatment, Redlich-Peterson, Removal, Solution, Textile Waste, Wastewaters

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Full Text: [2011\Des Wat Tre25, 297.pdf](2011/Des%20Wat%20Tre25,%20297.pdf)

Abstract: Pervaporation performance of crosslinked composite membranes of clinoptilolite (Clt) and sodium alginate (NaAlg) has been studied for the separation of dimethylformamide (DMF)/water mixtures. The effects of feed composition (0-100 wt. %) and operating temperature (20-50 degrees C) on the permeation rates and the separation factors were investigated. The observed flux values of composite membranes were much higher whereas the selectivities were lower than the plain NaAlg membranes. The highest permeation rate of 2.3 kg/m(2)h and selectivity of 23 was exhibited by the composite membranes depending on the operating conditions and Clt loading. In addition sorption-diffusion properties of the composite membranes were investigated at the operating temperatures and the feed compositions. It was found that the sorption selectivity was dominant factor for the separating of DMF/water mixtures for both types of membranes. The membranes were characterized by Fourier transform infrared spectrometry (FTIR), differential scanning calorimetry (DSC), thermal gravimetric analysis (TGA) and scanning electron microscopy (SEM).

Keywords: Acetic Acid Mixtures, Alginate, Analysis, Blend Membranes, Calorimetry, Clinoptilolite, Comparative Study, Composite, Composition, Crosslinking, Dehydration, Diffusion, Electron Microscopy, Feed, FTIR, Isopropanol Mixtures, Loading, Mixed Matrix Membranes, Molecular-Sieves, Natural, Natural Zeolite, Operating Conditions, Performance, Pervaporation, Pervaporation Performance, Poly(Vinyl Alcohol) Membranes, Polymer Network, Rates, Removal, Scanning Electron Microscopy, Selectivity, SEM, Separation, Separation Techniques, Sodium, Sorption, Spectrometry, Temperature, TGA, Zeolite, Zeolites

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Full Text: [2011\Des Wat Tre25, 310.pdf](2011/Des%20Wat%20Tre25,%20310.pdf)

Abstract: Plackett-Burman design was applied to identify the most significant factors in the removal of Basic Blue 3 (BB3), Methylene Blue (MB) and Basic Yellow 11 (BY11) by natural sugarcane bagasse. The effect of operating parameters on dye uptake was studied in a batch system and a mathematical model showing the influence of each variable was obtained. The interaction between the factors and their optimum levels for maximum percentage uptake of BB3 and MB were determined using Response Surface Methodology (RSM). Both models were highly significant with correlation coefficients (R-2) of 0.9932 and 0.9944 for BB3 and MB, respectively in binary dye solution. For BB3, the optimum adsorption conditions were determined as initial pH 6.00, contact time 122.50 min, initial dye concentration 50 mg/L and sorbent dosage 0.09 g. Whereas for MB, the model predicted that an uptake greater than 90% could be obtained when the initial dye concentration, contact time and sorbent dosage were set at 80.40 mg/L, 192.37 min and 0.17 g, respectively. The percentage uptake predicted by the model was in good agreement with the experimental values.

Keywords: Adsorption, Approach, Aqueous-Solutions, Bagasse, Basic Blue 3, Basic Dyes, Batch, Batch System, Binary, Blue, Cationic Dye, Concentration, Congo Red, Correlation, Design, Dye, Dyes, Equilibrium, Experimental, Interaction, Low-Cost Adsorbent, Mathematical Model, MB, Methylene Blue, Model, Models, Modified Rice Hull, Natural, Optimization, Orange Peel, pH, Plackett-Burman Design, Removal, Response Surface Methodology (RSM), Solution, Sorbent, Sugarcane, Sugarcane Bagasse, Surface, Uptake, Waste-Water

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Full Text: [2011\Des Wat Tre27, 319.pdf](2011/Des%20Wat%20Tre27,%20319.pdf)

Abstract: In this study, spent mushroom (SM) (*Tricholoma lobayense*) was used as a new low-cost adsorbent for removing Congo Red (CR) from aqueous solutions in a batch process at 25ºC. By varying the adsorbent dose, initial concentration, contact time, initial pH and particle size, the respective effects of these factors on the adsorption performance were explored. The sorption equilibrium data fitted Langmuir isotherm and the maximum adsorption capacity was 147.1 mg/g at 25ºC. The kinetic data obtained at different initial concentrations were analyzed using pseudo-first-order, pseudo-second-order and intraparticle diffusion equations. The pseudo-second-order described the adsorption of Congo Red on spent mushroom very well.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Agricultural Waste, Bagasse Fly-Ash, Basic Dye, Congo Red, Diffusion, Equilibrium, Isotherm, Isotherm, Kinetic, Kinetics, Kinetics, Langmuir, Langmuir Isotherm, Low-Cost Adsorbent, pH, Removal, Sorption, Spent Mushroom, Waste-Water

? Fard, R.F., Azimi, A.A. and Bidhendi, G.R.N. (2011), Batch kinetics and isotherms for biosorption of cadmium onto biosolids. *Desalination and Water Treatment*, **28** (1-3), 69-74.

Full Text: [2011\Des Wat Tre28, 69.pdf](2011/Des%20Wat%20Tre28,%2069.pdf)

Abstract: A basic investigation into the removal of cadmium ions from aqueous solutions by municipal-wastewater biosolids was conducted in batch conditions. The influences of different experimental parameters such as initial pH, shaking rate, sorption time, equilibrium conditions and initial cadmium-ion concentrations on cadmium uptake were evaluated. According to our experimental results, a pseudo-second-order model was more suitable for describing the biosorption kinetics than the Lagergren model. Kinetic experiments showed that cadmium concentrations reached equilibrium within 2 h. We found that the biosorptive capacity of the biosolids was dependent on solution pH, with pH 4 being optimal. Investigation of the influence of the shaking rate on the biosorption capacity of the biomass showed that an optimum value was obtained between 150 and 250 rpm. The Langmuir isotherm model better represented the sorption process the Freundlich model. The maximum cadmium adsorption capacity of the biosolids (q(max)) was 0.38 mm/g dry biosolid and the Langmuir constant (k(d)) was 0.1044 mm/l.

Keywords: Adsorption, and Isotherms, Aqueous-Solutions, Batch, Biomass, Biosolids, Biosorption, Cadmium, Copper(II), Cu(II), Equilibrium, Freundlich, Heavy-Metals, Ions, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Nickel(II), pH, Removal, Sludge, Sorption, Uptake, Zinc

? Aber, S. and Sheydaei, M. (2011), Application of physicochemically prepared activated carbon fiber for the removal of basic blue 3 from water. *Desalination and Water Treatment*, **28** (1-3), 97-102.

Full Text: [2011\Des Wat Tre28, 97.pdf](2011/Des%20Wat%20Tre28,%2097.pdf)

Abstract: In this study the adsorption of basic blue 3 (BB3) from aqueous solution onto activated carbon fiber (ACF) derived from Kenaf have been investigated. The adsorption studies include both equilibrium and kinetics. Langmuir, Freundlich and Temkin isotherm models were used to illustrate the experimental Equilibrium data and their constants. Obtained results revealed that equilibrium data fitted reasonably to the Langmuir isotherm model. According to Langmuir model, adsorption of BB3 on ACF was monolayer and the maximum adsorption capacity was 666.67 mg/g. The kinetic of adsorption was evaluated by pseudo-first-order, pseudo-secondorder and intraparticle diffusion kinetic models. Results of Kinetic studies showed that the adsorption process follows the pseudo-second-order model. According to pseudo-secondorder model the rate limiting step may be chemisorptions.

Keywords: Activated Carbon, Activated Carbon Fiber, Adsorption, Aqueous Solution, Basic Blue 3, Diffusion, Dye, Equilibrium, Freundlich, Hull, Isotherm, Kenaf, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Removal, Water

? Mckay, G., Hadi, M., Samadi, M.T., Rahmani, A.R., Aminabad, M.S. and Nazemi, F. (2011), Adsorption of reactive dye from aqueous solutions by compost. *Desalination and Water Treatment*, **28** (1-3), 164-173.

Full Text: [2011\Des Wat Tre28, 164.pdf](2011/Des%20Wat%20Tre28,%20164.pdf)

Abstract: The adsorption of a reactive dye, Ariazol Scarlet 2G (AS2G) (C. I.: Reactive Red 234), onto compost, from aqueous solutions, was studied in a batch system. The effects of initial dye concentration, initial pH and sorbent mass have been studied. Four two-parameter isotherm models-Langmuir, Freundlich, Temkin and Harkins Jura - were used to fit the experimental data using a nonlinear trial-and-error method. The best fit of the adsorption isotherm data was obtained using the Langmuir model (X-2 = 1.97E-03). A comparison of kinetic models applied to the adsorption of AS2G on compost was evaluated using the pseudo-second order, Elovich and Lagergren first-order kinetic models. Results showed that the pseudo-second order kinetic model was found to agree well with the experimental data. An intra-particle diffusion model analysis showed multi-linearity with two steps and a non-zero intercept which indicated the intra-particle diffusion model is not a dominant rate controlling mechanism in the sorption of AS2G by compost.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Isotherms, Color Removal, Compost, Desorption, Diffusion, Dye, Effluents, Freundlich, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Mechanism, Methylene-Blue, Natural Adsorbents, Nonlinear, pH, Reactive Dye, Sorbent, Sorption, Vineyard-Devoted Soils

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Full Text: [2011\Des Wat Tre28, 174.pdf](2011/Des%20Wat%20Tre28,%20174.pdf)

Abstract: Wangia profunda SM-A87, representative of a new genus of family Flavobacteriaceae, was isolated from deep-sea sediment samples near the southern Okinawa. The exopolysaccharides (EPS) produced by W. profunda SM-A87 was used as an absorbent of Pb(II) from low concentration solution in this paper. The effect of various parameters such as EPS concentration, pH, temperature, contact time, ionic strength and the competitive adsorption of Pb(II), Cu(II), Cd(II) were evaluated in batch technique. The adsorption kinetic and isotherm were also calculated. The preferences biosorption conditions were, EPS dosage at 0.1 similar to 0.2 mg/l, pH value at 5.5, temperature at 20 similar to 30ºC and contact time for 60 min, respectively. Coexistent cations decreased Pb(II) uptake in the order of K+<Na+<Ca2+<Mg2+. The maximum adsorption capacity of Pb(II) was 357 mg/g at 30 degrees C which was much higher than those of other biosorbents. The adsorption data fitted better to the Langmuir equation than Freundlich equation. The pseudo second-order kinetic model provided the better correlation for the adsorption process, compared with the pseudo first-order kinetic model. The competitive biosorption results indicated that Cu(II) had a greater effect on Pb(II) biosorption compared with Cd(II). Functional groups (-OH, -COO and C-O-C) of SM-A87 EPS possibly involved in Pb(II) biosorption process signed by the FT-IR spectrum. This paper indicates that SM-A87 EPS could be applied in wastewater treatment as a promising Pb(II) absorbent.

Keywords: Adsorption, Bacteria, Batch Technique, Biosorbents, Biosorption, Biosorption, Cadmium Removal, Cations, Cd(II), Copper Ions, Cu(II), Exopolysaccharides, Freundlich, FT-IR, FTIR, Fucus-Vesiculosus, Heavy-Metals, Ionic Strength, Ionic-Strength, Isotherm, Kinetic, Kinetic Model, Langmuir, Lead, Pb(II), pH, Pseudoalteromonas sp SM9913, Removal, Temperature, Uptake, Wangia Profunda Sm-A87, Waste-Water, Wastewater, Wastewater Treatment

? Liu, Z.R., Ye, R. and Sun, X.H. (2011), Adsorption of Th (IV) by peat moss. *Desalination and Water Treatment*, **28** (1-3), 196-201.

Full Text: [2011\Des Wat Tre28, 196.pdf](2011/Des%20Wat%20Tre28,%20196.pdf)

Abstract: The peat moss has been characterized and used for the removal of Th (IV) from aqueous solutions using batch adsorption experiments. Effects of factors such as pH, ionic strength, contact time, peat moss dosage and initial thorium concentration on thorium adsorption were studied. The results demonstrated that adsorption of Th (IV) on peat moss increase with increasing pH from 1 to 12 and with decreasing ionic strength. The kinetic process of adsorption can be described by the pseudo-second-order kinetics equation satisfactory. The adsorption isotherm was fitted reasonably well by Langmuir adsorption model.

Keywords: Adsorbent, Adsorption, Adsorption Isotherm, Aqueous-Solution, Behavior, Biosorption, Copper, Equilibrium, Fractions, Heavy-Metals, Ionic Strength, Isotherm, Kinetic, Kinetics, Langmuir, Peat Moss, pH, Removal, Residues, Thorium

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Full Text: [2011\Des Wat Tre28, 338.pdf](2011/Des%20Wat%20Tre28,%20338.pdf)

Abstract: The native and chemically modified corncobs were utilized as low-cost and efficient adsorbent to remove bromate from aqueous solution in this study. The parameters of the adsorbent i.e. adsorption capacity, selectivity, regenerability were investigated. All the experiments were conducted at the same adsorbent dose (0.2 g/200 ml) and the same temperature of 30ºC to investigate the effects of initial concentration of bromate, contact time, ionic strength and solution pH, then the optimal experimental conditions were ascertained. The results showed that the optimum conditions for the removal of bromate were at the aqueous solution with low ion concentration, pH of about 9.0 and equilibrium time of 80 min, respectively. Freundlich model fitted the adsorption data quite reasonably (R-2 > 0.92) and the maximum adsorption capacity was 101.01 mg/g. The experimental data followed the pseudo-second-order kinetic model very well. In addition, the removal percentages (%) of bromate by corncob modified by 80% isopropyl alcohol were higher than that by 20% isopropyl alcohol, 20% n-butyl alcohol, citric acid and HCl, similarly, were higher than the native corncob, corncob carbon and corncob ash. The removal percentages (%) of bromate by corncob carbon and corncob ash were higher than that by corncob with the bromate concentration of 40 mg/l.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Kinetics, Aqueous Solution, Biosorption, Bromate, Corncob, Dyes, Equilibrium, Freundlich, Heavy-Metal Removal, Ionic Strength, Ions, Kinetic, Kinetic Model, Modified Corncob, Orange Peel, pH, Potassium Bromate, Removal, Remove, Selectivity, Temperature, Water

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Full Text: [2011\Des Wat Tre28, 353.pdf](2011/Des%20Wat%20Tre28,%20353.pdf); [2011\Des Wat Tre28, 1.pdf](2011/Des%20Wat%20Tre28,%201.pdf)

Abstract: This study was designed to evaluate the global scientific output in the ISI subject category of “water resources” for the past 16 years. Data were based on the online version of the Science Citation Index Expanded, Web of Science, from 1993 to 2008. Articles referring to water resources were assessed for many aspects, including distributions of source countries, institutes, words in the title, author keywords, and KeyWords Plus. The h-index was also calculated in terms of the characteristics of publications. Distributions of paper titles, the author’s keywords, and KeyWords Plus at different periods were applied to evaluate research trends. The analysis showed that researchers paid most attention to groundwater and water quality parameters. Modeling and adsorption were the most popular techniques in water resources research. In addition, the relationship between the impact factor and h-index was significant for journals in the first group. The impact of the most cited articles each year were also discussed along with the article life information.

Keywords: Adsorption, Bibliometric, Bibliometric Analysis, Citation, Design, Exponential Model, h Index, h-Index, Hydrogeological Research, Impact Factor, Information, Journals, Management, Power Model, Publications, Research, Research Performance, Research Productivity, Research Trend, Science Citation Index, Scientometrics, Sewage, Trends, Water Resources, Web of Science

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Full Text: [2011\Des Wat Tre29, 10.pdf](2011/Des%20Wat%20Tre29,%2010.pdf)

Abstract: Dried waste sludge was used as adsorbent to remove methylene blue, crystal violet and basic fuchsine using batch systems. Rate experiments were performed at various initial adsorbate concentrations, adsorbent concentration and reaction temperature. The experimental data were analyzed using several kinetic equations to determine the best-fit equation and related parameters were calculated. It was shown that the adsorption of respective dye could be best described by Ho’s pseudo second order equation. The intraparticle diffusion played an important role in adsorption process. Effect of various initial adsorbent concentration and ionic strength on equilibrium was also investigated. Langmuir and Freundlich isotherms were applicable to the adsorption process and their constants were evaluated. Langmuir isotherm was found to be more suitable than Freundlich isotherm for correlation of equilibrium data. An increase in ionic strength exhibited an adverse effect on respective dye uptake. Desorption experiments showed that the loaded material could be regenerated unsatisfactorily.

Keywords: Activated-Sludge, Adsorption, Aqueous-Solutions, Azo-Dye, Basic Dyes, Biosorption, Crystal Violet, Desorption, Diffusion, Dye, Dyes, Equilibrium, Freundlich, Freundlich Isotherm, Ionic Strength, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Metal-Ions, Methylene Blue, Methylene-Blue, Modeling, Removal, Sewage Sludges, Sorption, Temperature, Uptake, Waste, Waste Sludge, Water

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Full Text: [2011\Des Wat Tre29, 29.pdf](2011/Des%20Wat%20Tre29,%2029.pdf)

Abstract: The sorption of Safranine onto the *Archis hypogaea L.* (groundnut) shell (GNS) has been studied in terms of pseudo first order, pseudo second order, Elovich and intraparticle diffusion chemical sorption processes. The batch sorption model, based on the assumption of a pseudo second order mechanism has been used to predict the rate constant of sorption and the equilibrium capacity with the effect of mass of adsorbent, initial dye concentration, pH and contact time. The rates of sorption were found to be conforming pseudo second order kinetics with good correlation. Batch isotherm studies for sorption of Safranine on Archis hypogaea L. shell (GNS) were described by Freundlich and Langmuir isotherm equation. In adsorption isotherms, Langmuir isotherm fits well with experimental data having r2 > 0.9956. The maximum adsorption capacity observed was 172.14 mg/g. The values of dimensionless separation factor R-L are 0 < R-L < 1 indicating that favorable adsorption. The adsorbent was also characterized by FTIR, XRD and SEM analysis.

Keywords: Acid Dyes, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Aqueous-Solutions, Archis Hypogaea, Batch, Biosorption, Biosorption, Carbon, Copper, Diffusion, Dye, Dye Removal, Equilibrium, Freundlich, Ftir, Isotherm, Isotherms, Kinetics, Langmuir, Langmuir Isotherm, Mechanism, Peat, pH, Removal, Safranine, Sem Analysis, Separation, Sorption, Waste

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Full Text: [2011\Des Wat Tre29, 110.pdf](2011/Des%20Wat%20Tre29,%20110.pdf)

Abstract: In this study, activated carbon was prepared from olive bagasse by physical activation. The pore properties including the BET surface area, pore volume, pore size distribution and average pore diameter were characterized. BET surface area of the activated carbon was determined as 803 m2 g-1. In this study, boron removal from aqueous solutions by adsorption was investigated. In the batch mode adsorption studies, the effects of initial pH of solution, contact time, temperature and initial boron concentration of solution were examined. A comparison of kinetic models applied to the adsorption of boron onto activated carbon was evaluated for the pseudo-first order, pseudo-second order, intraparticle diffusion, Elovich and Bangham’s kinetic models. The experimental data fitted the pseudo-first order and intraparticle diffusion kinetic model. The thermodynamic parameters were also calculated. In the isotherm studies, the Langmuir, Freundlich and Dubinin-Radushkevich (DR) isotherm models were applied. The results indicate that Freundlich and DR equations are well described with the adsorption data for boron adsorption.

Keywords: Activated Carbon, Adsorbents, Adsorption, Batch, Bet Surface Area, Boron, Chemical Activation, Diffusion, Dye, Fly-Ash, Freundlich, Ion-Exchange-Resins, Isotherm, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Langmuir, Olive Bagasse, pH, Removal, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Waste-Water

? Matheswaran, M. (2011), Kinetic studies and equilibrium isotherm analyses for the adsorption of Methyl Orange by coal fly ash from aqueous solution. *Desalination and Water Treatment*, **29** (1-3), 241-251.

Full Text: [2011\Des Wat Tre29, 241.pdf](2011/Des%20Wat%20Tre29,%20241.pdf)

Abstract: The coal fly ash waste generated from thermal power plant has been used as low cost adsorbent for the removal of methyl orange (MO) from the aqueous solution. In the batch experiments, the effect of various parameters was studied such as contact time, pH, adsorbent dosage, dye concentration and temperature. The adsorption of MO on the fly ash at different temperatures follows the pseudo second order kinetics. Freundlich, Langmuir, Redlich-Peterson (R-P), Temkin and Dubnin-Radushkevich isotherm models using nonlinear regression technique for the adsorption of MO were analyzed. R-P and Langmuir isotherms were found to be suitable to represent the data for adsorption. Error analysis shows that the Langmuir isotherm best fits the adsorption data at various temperatures. Isotherms have also been used to obtain thermodynamic parameters such as free energy, enthalpy and entropy. The adsorption of MO was exothermic in nature (Delta H: -38.16 to -36.41 kJmol(-1)) with increasing temperature over range of 303-333 K.

Keywords: Activated Carbon, Adsorption, Aqueous Solution, Basic Dye, Blue, Color Removal, Diffusion, Dye, Dye Removal, Equilibrium, Fly Ash, Freundlich, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Methyl Orange, Nonlinear, pH, Removal, Sorption, Temperature, Textile Effluents, Thermodynamic, Thermodynamic Parameters, Waste, Waste-Water

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Full Text: [2011\Des Wat Tre29, 317.pdf](2011/Des%20Wat%20Tre29,%20317.pdf)

Abstract: The work presented in this paper focuses on studying the batch adsorption of a basic dye, Methylene Blue (MB), from aqueous solution onto the spent cottonseed hull substrate (SCHS) after used for Pleurotus ostreatus cultivation, in order to explore its potential use as a low-cost natural biosorbent for dye removal from wastewater. The biosorbent-MB interaction mechanism was investigated using a combination of FTIR and SEM techniques. Variables of the system, including solution pH, particle size, reaction time, SCHS dosage and initial MB concentration, were adjusted to study their effects on MB biosorption. The results showed that the kinetics of dye removal by SCHS was rapid, with 90.0% sorption within the first 5 min and equilibrium attained after 180 min. Biosorption kinetics and equilibrium followed the pseudo-second-order and Langmuir adsorption models. The maximum amount of MB adsorbed on SCHS was 185.22 mg/g. As a new adsorbent, experimental study showed that vast potential capacity for adsorbing MB existed in the SCHS.

Keywords: Activated Carbon, Adsorption, Aqueous Solution, Basic Dye, Biosorbent, Biosorption, Biosorption Kinetics, Dye, Dye Removal, Equilibrium, Fixed-Bed Column, FTIR, Isotherm, Kinetics, Langmuir, Mechanism, Methylene Blue, Mushroom Compost, Oak Sawdust, pH, Pleurotus Ostreatus, Removal, Rice Husk, Sorption, Spent Cottonseed Hull Substrate (SCHS), Waste-Water, Wastewater

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Full Text: [2011\Des Wat Tre30, 1.pdf](2011/Des%20Wat%20Tre30,%201.pdf)

Abstract: Lead adsorption from aqueous solutions was studied with the aim of detoxifying industrial effluents before their safe disposal onto land or into river waters. Cotton stalk, a waste and renewable agricultural by-product, was synthesized as an effective adsorbent by steam activation for lead removal. The effect of various parameters such as solution pH, contact time, initial lead concentration, adsorbent dose and temperature was studied to optimize the conditions for maximum adsorption. The obtained equilibrium data were mathematically modeled using Langmuir, Freundlich and Langmuir-Freundlich equations to describe the equilibrium isotherms at different temperatures, and the kinetics data were fitted with the pseudo-first-order, pseudo-second-order and Elovich models. The optimum solution pH for the removal of lead ions was found to be 5.8. The maximum adsorption capacity was found to be 53.5 mg of lead per gram of activated carbon, and the adsorption isotherms followed well the Langmuir-Freundlich adsorption models. The kinetic rates were best fitted to the pseudo-second-order model. Thermodynamic study showed the adsorption was a spontaneous and exothermic process. The above results showed that the activated carbon fibre prepared in this study does offer favorable characteristics in lead adsorption from weak acidic wastewater.

Keywords: Activated Carbon, Activated Carbon Fibre, Adsorbent, Adsorption, Adsorption Isotherm, Adsorption Isotherms, Aqueous-Solution, Chromium, Cotton Stalk, Equilibrium, Equilibrium Isotherms, Fly-Ash, Freundlich, Ions, Isotherms, Kinetic, Kinetics, Kinetics, Langmuir, Lead, Lead Adsorption, Lead Removal, Pb(II), pH, Removal, Temperature, Thermodynamic, Waste, Wastewater, Water

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Full Text: [2011\Des Wat Tre30, 195.pdf](2011/Des%20Wat%20Tre30,%20195.pdf)

Abstract: The natural wheat straw (NWS) was modified by ethylenediamine and the modified wheat straw (MWS) was used as adsorbent for removal of congo red (CR) from aqueous solution. Analysis of FTIR and nitrogen element showed that amino group was introduced to NWS. A batch system was applied to study the behavior of CR adsorption on MWS. Experiments were carried out as function of pH, adsorbent dosage, contact time and dye concentration. The equilibrium adsorption data were analyzed by Langmuir, Freundlich, Redlich-Peterson models and Koble-Corrigan. Redlich-Peterson and Koble-Corrigan models provided the best correlation. The adsorption capacities from Langmuir model were 68.6 mg g-1 at 293 K. Adsorption kinetic data were fitted using the pseudo-first-order kinetic model, pseudo-second-order kinetic model, Elovish model and intraparticle diffusion model. The results showed that the Elovish model was best to fit the kinetic process, which suggested that ion exchange was one of main mechanism. The effective diffusion parameter D(i) values indicated that the intraparticle diffusion was not the rate-controlling step. The thermodynamics parameters of CR/MWS system indicated the spontaneous and endothermic process. MWS had higher capacity for removal of CR. It was implied that MWS may be suitable as adsorbent material for adsorption of CR from aqueous solutions.

Keywords: Adsorbent, Adsorption, Adsorption Kinetic, Agricultural Waste, Aqueous Solution, Aqueous-Solution, Citric-Acid, Congo Red, Diffusion, Dye, Equilibrium, Ethylenediamine, FITR, Fixed-Bed Column, Freundlich, FTIR, Ion Exchange, Ion-Exchange, Kinetic, Kinetic Model, Langmuir, Low-Cost Adsorbents, Mechanism, Methylene-Blue, pH, Reactive Dyes, Removal, Rice Husk, Textile Dye Effluent, Thermodynamics, Treatment Technologies, Wheat Straw

? Chowdhury, S. and Saha, P. (2011), Pseudo-second-order kinetic models for the sorption of malachite green onto *Tamarindus indica* seeds: Comparison of linear and non-linear methods. *Desalination and Water Treatment*, **30** (1-3), 229-236.

Full Text: [2011\Des Wat Tre30, 229.pdf](2011/Des%20Wat%20Tre30,%20229.pdf)

Abstract: In this study, the sorption of malachite green, a basic dye onto *Tamarindus indica* seed was studied by performing batch kinetic sorption experiments. The equilibrium kinetic data were analyzed using the pseudo-second-order kinetic model. A comparison between linear least-squares method and non-linear regression method of estimating the kinetic parameters was examined. Four pseudo-second-order kinetic linear equations were discussed. The coefficient of determination (r(2)), average relative error (ARE) and the chi-square (χ2) test were employed as error analysis methods to determine the best-fitting equation. Kinetic parameters obtained from four kinetic linear equations using the linear method differed but they were the same when non-linear method was used. Type 1 pseudo-second-order kinetic model very well represented the kinetic uptake of malachite green by *Tamarindus indica* seeds while Type 4 exhibited the worst fit. Present investigation showed that the non-linear method may be a better way to determine the kinetic parameters.

Keywords: Activated Carbon, Adsorption, Aqueous-Solution, Biosorption, Dye, Equilibrium, Heavy-Metals, Kinetic, Kinetic Model, Kinetic Models, Linear Method, Malachite Green, Non-Linear Method, Nonlinear, Nonlinear Method, Parameters, Pseudo-Second-Order, Removal, Sorption, *Tamarindus Indica* Seed, Thermodynamics, Uptake

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Full Text: [2011\Des Wat Tre30, 339.pdf](2011/Des%20Wat%20Tre30,%20339.pdf)

Abstract: Palygorskite has excellent sorption properties due to its porous structure and fibrous morphology. In this paper, the thermal modified palygorskite was prepared and characterized by X-ray powder diffraction (XRD), scanning electron microscope (SEM), N(2) adsorption-desorption and thermogravimetric-differential scanning calorimetry (TG-DSC) analysis. The adsorption properties of the raw palygorskite and the thermal modified palygorskite were investigated by removal of methylene blue (MB) from aqueous solution. The effects of the calcination temperature, the initial MB concentration and the pH value on the MB removal were evaluated. The results show that the structure of palygorskite was destroyed gradually with increasing the calcination temperature, and the adsorption capacity of the palygorskite can be improved by thermal modification in appropriate temperature ranges. The isotherms and the kinetic data of the MB adsorption onto the modified palygorskite were studied by the Freundlich model and the pseudo-second order model, respectively.

Keywords: Activated Carbons, Adsorption, Adsorption-Kinetics, Aqueous Solution, Aqueous-Solutions, Characterization, Clay, Equilibrium, Freundlich, Heavy-Metals, Isotherms, Kinetic, Low Cost Adsorbent, MB Adsorption, Methylene Blue, Methylene-Blue, Palygorskite, pH, Photocatalytic Properties, Removal, SEM, Sepiolite, Sorption, Sorption Properties, Temperature, Thermal Modification, Wastewater

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Full Text: [2011\Des Wat Tre31, 107.pdf](2011/Des%20Wat%20Tre31,%20107.pdf)

Abstract: This study focused on macrofungi Lentinus edodes residue immobilized by polyvinyl alcohol (PVA)-Na-alginate (SA) for lead (Pb) and cadmium (Cd) adsorption. Based on the ability of absorbing Pb2+ and Cd2+ from aqueous solution, the mechanical strength and balling property, an orthogonal experiment was done to confirm the optimum formulation of PVA-SA’s immobilizing L. edodes. The optimum immobilization formulation for absorbing Pb2+ was 8% (m/V) PVA + 1% SA + 3% L. edodes + 2% CaCl2 in saturated H3BO3 solution with adsorption rate of 95.4%, while that for absorbing Cd2+ was 5% PVA + 1% SA + 3% L. edodes + 2% CaCl2 in saturated H3BO3 with adsorption rate of 63.7%. The Langmuir isotherm model best described free L. edodes for Pb2+ adsorption with R(2) of 0.9939. Freundlich isotherm model best described free L. edodes for Cd2+ adsorption with R(2) of 0.9993 and best described Pb2+ and Cd2+ adsorption by immobilized L. edodes with R(2) of 0.9587 and 0.9823 respectively. The adsorption for Pb2+ and Cd2+ by L. edodes reached equilibrium within 1 h with equilibrium quantity (q(e)) of 0.8440 mg Pb2+/g and 1.8120 mg Cd2+/g respectively, while that by immobilized L. edodes reached equilibrium within 3 h and 7 h separately with q(e) of 0.4925 mg Pb2+/g and 0.2008 mg Cd2+/g respectively. The pseudo-second-order model fit well Cd2+ and Pb2+ adsorption kinetics by free L. edodes and immobilized L. edodes. The rate constant k(2) of the pseudo-second-order model was 1.2531 for Cd2+ adsorption and was 1.3241 for Pb2+ by free L. edodes, and that was 0.7805 for Pb2+ and 0.2310 for Cd2+ by immobilized L. edodes respectively. The theoretic maximum adsorption quantity (q(m)) of of 6.4475 mg/g for Cd2+ by immobilized L. edodes was higher than q(m) of 2.8321 mg/g for Cd2+ by free L. edodes calculated from the Langmuir model and the k value of 3.0401 by immobilized L. edodes calcuated from the Freundlich model for Pb2+ adsorption was higher than the k value of 0.7704 for Cd2+ adsorption by free L. edodes indicated that after immobilization treatment, the capacity of L. edodes for Pb2+ and Cd2+ adsorption increased, and the adsorption ability for Pb2+ was stronger than Cd2+ by immobilized L. edodes.

Keywords: Adsorption, Adsorption Kinetics, Alginate, Aqueous Solution, Biosorption, Cadmium, Cells, Equilibrium, Freundlich, Freundlich Isotherm, Gel, Immobilization, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Lead, Lentinus Edodes Residue, Pb, Polyvinyl-Alcohol PVA, Pseudo Second Order, PVA, PVA-SA, Sorption, Thermodynamics

# Title: Desalination and Water Treatment-Science and Engineering

Full Journal Title: [Desalination and Water Treatment-Science and Engineering](http://www.deswater.com/contents-dwt.php)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories

: Impact Factor

? Lisitsin, D., Hasson, D. and Semiat, R. (2009), Modeling the effect of anti-scalant on CaCO3 precipitation in continuous flow. *Desalination and Water Treatment-Science and Engineering*, **1** (1-3), 17-24.

Full Text: [2009\Des Wat Tre-Sci Eng1, 17.pdf](2009/Des%20Wat%20Tre-Sci%20Eng1,%2017.pdf)

Abstract: Scale inhibition by anti-scalants is known to involve blockage of active growth sites by adsorbed inhibitor molecules, but there is virtually no quantitative information on the kinetics of anti-scalant retarded precipitation. This paper presents a model integrating the process of anti-scalant adsorption on precipitated CaCO3 particles with the kinetics of the ensuing retarded precipitation. Adsorption is analyzed according to the Langmuir, Freundlich and Langmuir-Freundlich models, and CaCO3 precipitation is described by the commonly used surface reaction controlled model. The proposed model is validated by experimental data measured in a continuous flow precipitation system over a wide range of conditions.

Keywords: CaCO3 Precipitation, Anti-Scalants, Scale Inhibition, Adsorption Isotherms, Kinetics, Crystallization Kinetics, Crystal-Growth, Calcium-Carbonate, Impurities

? Fungaro, D.A., Bruno, M. and Grosche, L.C. (2009), Adsorption and kinetic studies of Methylene blue on zeolite synthesized from fly ash. *Desalination and Water Treatment-Science and Engineering*, **2** (1-3), 231-239.

Full Text: [2009\Des Wat Tre-Sci Eng2, 231.pdf](2009/Des%20Wat%20Tre-Sci%20Eng2,%20231.pdf)

Abstract: Batch sorption experiments were carried out to remove methylene blue from its aqueous solutions using zeolite synthesized from fly ash as an adsorbent. Nearly 10 min of contact time are found to be sufficient for the adsorption of dye to reach equilibrium. Equilibrium data have been analyzed using Langmuir and Freundlich isotherms and the results were found to be well represented by the Freundlich isotherm equation. Adsorption data were fitted to both Lagergren first-order and pseudo-second-order kinetic models and the data were found to follow pseudo-second-order kinetics. Thermodynamic calculations Suggest that the adsorption of methylene blue on zeolite synthesized from fly ash is spontaneous and exothermic reaction.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Kinetics, Aqueous-Solution, Basic Dye, Coal Ash, Dye Adsorption, Mechanism, Methylene Blue, Removal, Sorption, Sphagnum Moss Peat, Thermodynamics, Waste-Water, Zeolite

? Ofomaja, A.E. (2009), Equilibrium sorption of methylene blue using mansonia wood sawdust as biosorbent. *Desalination and Water Treatment-Science and Engineering*, **3** (1-3), 1-10.

Full Text: [2009\Des Wat Tre-Sci Eng3, 1.pdf](2009/Des%20Wat%20Tre-Sci%20Eng3,%201.pdf)

Abstract: The potential use of mansonia wood sawdust as low-cost adsorbent for the sorptive removal of basic dye, methylene blue, from aqueous solution has been studied. The effect of sawdust particle size on the equilibrium methylene blue uptake was examined using batch sorption technique. Adsorption isotherm was determined using various particle sizes (150, 250, 350, 450 and 550pm) of mansonia sawdust at 26°C and the experimental data obtained were modeled using the Langmuir, Freundlich, Tempkin and Dubinin-Radushkevich isotherms. The results revealed that the sawdust particle size has a strong influence on the percentage dye removal and on the amount of dye adsorbed per gram of sawdust from a 120 mg/dm3 dye solution. Increasing sawdust particle size from 150 to 550 Pm reduced the percentage dye uptake from 93.57% to 29.50% and amount of dye adsorbed per gram of sawdust from 28.07 to 8.85 mg/g. The isotherm data were found to be well described by the Langumir, Tempkin and Dubinin-Radushkevich isotherm models. The monolayer capacity calculated from the Langmuir equation is given as 33.44 mg/g using sawdust of particle size 150 pm. The equilibrium binding constant K-1 calculated from the Tempkins was reduced with increasing sawdust particle size from 150 to 550 μm, while the mean free energy of sorption per mole of sorbate calculated from the Dubinin-Radushkevich isotherm was in the range 12.91 to 13.89 mol2kJ-2, suggesting that the sorption mechanism was by ion exchange. A mathematical relationship was also drawn between the equilibrium sorption capacity and the change in pH (ΔH+) at the end of the isotherm experiments with varying initial dye concentration, Supporting the fact that sorption of methylene blue dye on mansonia sawdust is by ion exchange. Desorption of sorbed dye molecules into solution was achieved at low pH conditions.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Aqueous Solution, Aqueous-Solution, Bagasse Pith, Basic Dye, Batch, Binding, Biosorbent, Capacity, Concentration, Data, Desorption, Dye, Dye Removal, Energy, Equilibrium, Experimental, Experiments, Fixed-Bed, Freundlich, Indica Leaf Powder, Ion Exchange, Ion-Exchange, Isotherm, Isotherms, Langmuir, Langmuir Equation, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Low-Cost Adsorbents, Mansonia Sawdust, Mansonia Wood Sawdust, Mar, Mechanism, Methylene Blue, Methylene Blue Dye, Models, Monolayer, Monolayer Capacity, Particle Size, pH, Potential, Reactive Dyes, Removal, Sawdust, Size, Solution, Sorbate, Sorption, Sorption Capacity, Sorption Isotherm, Sorption Mechanism, Tree Fern, Uptake, Waste-Water, Wood

? Atia, A.A., Donia, A.M., Hussin, R.A. and Rashad, R.T. (2009), Swelling and metal ion uptake characteristics of kaolinite containing poly [(acrylic acid)-co-acrylamide] hydrogels. *Desalination and Water Treatment-Science and Engineering*, **3** (1-3), 73-82.

Full Text: [2009\Des Wat Tre-Sci Eng3, 73.pdf](2009/Des%20Wat%20Tre-Sci%20Eng3,%2073.pdf)

Abstract: Hydrogels of poly [(acrylic acid)-co-acrylamide], with N,N’-methylene bisacrylamide (MBA) crosslinker and different compositional ratios of kaolinite were prepared and investigated. The swelling characteristics of the hydrogels were investigated in distilled water as a function of clay content. The clay-hydrogel composite of 5.3%. clay percentage showed a higher swelling property in distilled water relative to clay-free hydrogel. The swelling ratio was found to be affected by the change in contact time, pH, salt solution and temperature. The adsorption properties of the hydrogels towards Mn(II), Cu(II) and Zn(II) in aqueous solutions were also studied at different conditions. The rate of adsorption followed the pseudo-second-order kinetics. Elution behavior of loaded hydrogel (P3) was also studied in EDTA solution.

Keywords: Acid Hydrogels, Acrylamide, Acrylamide Polymers, Adsorption, Diffusive Gradients, Fertilizer, Hydrogels, Kaolinite, Metal Ions, Removal, Slow-Release, Soil, Superabsorbent, Swelling, Thin-Films Technique, Water Sorption

? El-Latif, M.M.A. and Ibrahim, A.M. (2009), Adsorption, kinetic and equilibrium studies on removal of basic dye from aqueous solutions using hydrolyzed Oak sawdust. *Desalination and Water Treatment-Science and Engineering*, **6** (1-3), 252-268.

Full Text: [2009\Des Wat Tre-Sci Eng6, 252.pdf](2009/Des%20Wat%20Tre-Sci%20Eng6,%20252.pdf)

Abstract: Oak sawdust (SD), which is the main waste from furniture industry in Egypt, has been used as an adsorbent without treatment or it was treated with 0.1 N sodium hydroxide (SD1) and 0.1 N sulphuric acid (SD2). Different adsorbents were characterized by SEM, TGA and FTIR to clarify the effect of treatment on the adsorption process. Oak sawdust and different treated Oak sawdust have been used for the removal of methylene blue dye from aqueous solutions. Batch adsorption experiments were performed as a function of pH, adsorbent dose, agitation speed, contact time and initial dye concentration. The optimum pH required for maximum adsorption was found to be 8. The experimental equilibrium adsorption data are tested for Langmuir, Freundlich and Temkin isotherms. Results indicate the following order to fit the isotherms: Langmuir > Temkin >>> Freundlich adsorption. Kinetics data were modeled using the pseudo-first and pseudo-second order, Elovich equations and intra-particle diffusion models. The results indicate that the second-order model best describes adsorption kinetic data with regard to the intra-particle diffusion rate. Thermodynamic parameters ΔH, ΔS and ΔG have been calculated for each type of adsorbents. Positive value of ΔH and negative value of ΔG show endothermic and spontaneous nature of adsorption respectively, also activation energy Ea has been calculated.

Keywords: Acid Dye, Activated Carbon, Activation, Activation Energy, Adsorbent, Adsorbent Dose, Adsorbents, Adsorption, Adsorption Kinetic, Agitation, Aqueous Solutions, Basic Dye, Batch Adsorption, Cationic Dye, Coir Pith, Concentration, Copper, Data, Diffusion, Dye, Egypt, Elovich, Endothermic, Energy, Equilibrium, Equilibrium Studies, Experimental, Experiments, Fixed-Bed, Freundlich, FTIR, Function, Hydroxide, Infrared-Spectroscopy, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherms, Kinetic, Kinetics, Langmuir, Methylene Blue, Model, Models, N, Palm-Fruit Bunch, pH, Pseudo Second Order, Pseudo-First And, Pseudo-Second Order, Pseudo-Second-Order, Removal, Sawdust, Second Order, Second-Order, Second-Order Model, SEM, Sodium, Solutions, Sorption, Sulphuric Acid, TGA, Thermodynamic, Thermodynamic Parameters, Treatment, Value, Waste, Wood Sawdust

? Adak, A. and Pal, A. (2009), Removal kinetics and mechanism for phenol uptake by surfactant-modified alumina. *Desalination and Water Treatment-Science and Engineering*, **6** (1-3), 269-275.

Full Text: [2009\Des Wat Tre-Sci Eng6, 269.pdf](2009/Des%20Wat%20Tre-Sci%20Eng6,%20269.pdf)

Abstract: The present work has been devoted to study the kinetics and the mechanism of the phenol removal from water by surfactant-modified alumina (SMA). 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 was used for the removal of phenol from aquatic environment through the process, called adsolubilization. The SMA was found to be very efficient showing >90% phenol removal from a 50 mg/L phenol bearing solution with only 12 g/L of adsorbent dose. The kinetic study was conducted and the experimental data were analysed by different kinetic models viz., first order, second order, pseudo-first and pseudo-second order models. The details of rate-limiting step were studied. Isotherm study was conducted to find the maximum adsorption capacity and different isotherm models were analysed. The experiments were conducted with both phenol-spiked distilled water and synthetically prepared wastewater.

Keywords: Activated Carbon, Adsolubilization, Adsolubilization, Adsorbent, Adsorbent Dose, Adsorption, Adsorption, Adsorption Capacity, Alumina, Anionic Surfactant, Aquatic Environment, Aqueous-Solution, Capacity, Data, Degradation, Environment, Experimental, Experiments, First, First Order, Isotherm, Kinetic, Kinetic Models, Kinetic Study, Kinetics, Mechanism, Models, Modification, Phenol, Phenol Removal, Pseudo Second Order, Pseudo-First and, Pseudo-Second Order, Pseudo-Second-Order, Rate Limiting Step, Rate-Limiting Step, Removal, SDS, Second Order, Second-Order, Silica, Sodium Dodecyl Sulfate, Solution, Sulfate, Surface, Surface Modification, Surfactant, Surfactant-Modified Alumina, Uptake, Waste-Water, Wastewater, Water, Work

# Title: DESIDOC Bulletin of Information Technology

Full Journal Title: [DESIDOC Bulletin of Information Technology](http://vnweb.hwwilsonweb.com/hww/Journals/getIssues.jhtml?sid=HWW:OMNIS&id=07029)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories

: Impact Factor

? Gupta, B.M. and Bhattacharya, S. (2004), A bibliometric approach towards mapping the dynamics of science and technology. *DESIDOC Bulletin of Information Technology*, **24** (1), 3-8.

Full Text: DES Bul Inf Tec24, 3.pdf

Abstract: This paper attempts to highlight the role of bibliometrics in studying the dynamics of science and technology. Tools and techniques available in bibliometrics to address and understand the complexities of scientific fields are explored. The paper concludes that for wider acceptance among academicians and policy makers, bibliometric approach should ingrain itself within sociology and philosophy of science in studying the different facets of science and technology.

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Full Text: DES Bul Inf Tec26, 9.pdf

Abstract: This paper attempts to provide detailed quantitative analysis of Indian contributions on thorium in terms of publications output as per International Nuclear Information System database during 1970-2004. A total of 2399 papers were published by the Indian scientists in the field of thorium. There were only nine publications in 1970. Thereafter, a steady growth was observed except for the period 1983-1985. The highest papers (188) were published in the year 2000. USA with 8049 (28.05 per cent) and India with 2399 (8.30 per cent) publications were the top two countries who published work on thorium. Authorship and collaboration trend was towards multi-authored papers as 85.70 per cent of the papers were collaborative. There were 79 international collaborative papers. Bilateral collaboration accounted for 90.14 per cent of total collaborative papers. Bhabha Atomic Research Centre, Mumbai topped the list with 1251 authorships followed by Indira Gandhi Centre for Atomic Research, Kalpakkam with 168, Atomic Minerals Division, Hyderabad with 71, Utkal University, Bhubaneswar with 43 and Saha Institute of Nuclear Physics, Kolkata with 31 authorships, respectively. The journals most preferred by the scientists for publication of papers were: Journal of the Indian Chemical Society with 78 papers, followed by the Indian Journal of Chemistry A with 60 papers, Bulletin of Radiation Protection with 56 papers, Journal of Radio Analytical and Nuclear Chemistry with 54 papers, Radiation Protection and Environment with 37 papers, Exploration and Research for Atomic Minerals and Journal of Geological Society of India with 35 papers each. English was the most predominant language used by the scientists for communication.

Keywords: Analysis, Collaboration, Communication, Database, Field, Growth, India, International, Journals, Mumbai, Papers, Publication, Publications, Quantitative Analysis, Research, Trend, USA, Work

# Title: Design Studies

Full Journal Title: Design Studies

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories

: Impact Factor

? Youmans, R.J. (2011), The effects of physical prototyping and group work on the reduction of design fixation. *Design Studies*, **32** (2), 115-138.

Full Text: [2011\Des Stu32, 115.pdf](2011/Des%20Stu32,%20115.pdf)

Abstract: Innovation is important for successful designs, but design fixation likely prevents designers from reaching their innovative potential. Participants in this study were 120 students, 80 of which had design backgrounds. Participants saw an example tool, and then worked alone or in small groups to design two new tools using a construction set. All participants designed two tools: one in a physical prototyping environment and one in an environment without physical prototyping. Results showed that designs were better and contained fewer fixations to the example tool when designed in the physical prototyping environment, but that groups designed better tools than individuals or nominal groups when no physical prototyping was available. These results underscore the importance of physical prototyping in design. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Creativity, Creativity, Cryptomnesia, Design Fixation, Design Techniques, Environment, Examples, Generation, Group Work, Group-Performance, Incubation, Innovation, Problem-Solving Task, Productivity, Students, Thinking, Unconscious Plagiarism

? Chai, K.H. and Xiao, X. (2012), Understanding design research: A bibliometric analysis of *Design Studies* (1996-2010). *Design Studies*, **33** (1), 24-43.

Full Text: [2012\Des Stu33, 24.pdf](2012/Des%20Stu33,%2024.pdf)

Abstract: The purpose of this paper is to investigate the core themes of design research by analysing citations of papers in the journal Design Studies. It also aims to find out the evolution and future trends of design research. Employing a bibliometrics and network analysis, the paper analyses citations and co-citations from Design Studies. Instead of using the standard analysis method of aggregating author co-citations, this study conducts the analysis at the individual publication level. Due to the limitation of the Scopus database, this study only managed to extract articles with full citations in Design Studies from 1996 to 2010. Further studies could also include articles from 1979 to 1995 by either using some character recognition software or manually extracting them. The study identifies the core themes centered on design process and design cognition. In addition, it also reveals that the research method protocol analysis has become more popular in recent years among researchers. The main contribution of this paper is the use of a network analysis technique to analyse 12 107 citations in the 459 articles published in Design Studies between 1996 and 2010. Unlike previous review papers which relied heavily on the qualitative observations and reflections of the authors, this paper is the first comprehensive quantitative analysis in this field. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Analysis, Author, Authors, Bibliometric, Bibliometric Analysis, Bibliometric Study, Bibliometrics, Character, Citations, Cocitation Analysis, Cognition, Contribution, Design, Design Research, Engineering Design, Evolution, Information, Intellectual Structure, Journal, Management Research, Network, Network Analysis, Papers, Process, Protocol, Publication, Qualitative, Quantitative, Recognition, Research, Research Method, Researchers, Review, Science, Science of Design, Scopus, Software, Themes, Trends

# Title: Deutsche Medizinische Wochenschrift

Full Journal Title: Deutsche Medizinische Wochenschrift

ISO Abbreviated Title: Deut. Med. Wochenschr.

JCR Abbreviated Title: Deut Med Wochenschr

ISSN: 0012-0472

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Language: English

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Publisher Address: Rudigerstr 14, D-70469 Stuttgart, Germany

Subject Categories

Medicine: Impact Factor 0.788, / (2000)

General & Internal: Impact Factor 0.788, / (2000)

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? Rieger, H.J. (1992), Accounting problems - Performance according to outsiders and radioimmunoassays without corresponding authorization - Ruling of the Munich Amtsgericht in March 1992. *Deutsche Medizinische Wochenschrift*, **117** (46), 1774-1775.

Keywords: Performance

? Navarro, F.A. (1996), English or German? The language of medicine in original papers cited in *Deutsche Medizinische Wochenschrift* from 1920 to 1995. *Deutsche Medizinische Wochenschrift*, **121** (50), 1561-1566.

Abstract: Aim of study: To describe and analyse the frequency of English and German in the bibliographical references from the original articles published in “Deutsche Medizinische Wochenschrift” during the past 75 years (1920-1995).

Methods: The language of publication of 16001 references from 800 original papers, at the rate of 50 articles per year at intervals of 5 years, was determined.

Results: The percentage of references in German has been decreasing during the whole studied period: 90.1% in 1920, 85.9% in 1935, 75.8% in 1950, 44.1% in 1965, 31.0% in 1980, and 16.4% in 1995. The percentage of references in English, on the contrary, has continued to increase: 3.2% in 1920, 10.6% in 1935, 21.5% in 1950, 50.0% in 1965, 66.2% in 1980, and 82.8% in 1995.

Conclusion: Even though the importance of English has been increasing during the entire considered period, it did not clearly supplant German as the main language of medicine in Germany until 1975.

Keywords: Scientific Activity, Science

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? Stille, W. (2003), SARS - episode or catastrophe? *Deutsche Medizinische Wochenschrift*, **128** (20), 1101-1102.

? Rickerts, V., Wolf, T., Rottmann, C., Preiser, W., Drosten, C., Jakobi, V., Leong, H.N. and Brodt, H.R. (2003), Clinical presentation and management of the severe acute respiratory syndrome (SARS). *Deutsche Medizinische Wochenschrift*, **128** (20), 1109-1114.

Abstract: Background and objective: In February 2003, a newly emerged infectious disease was described, the etiology of which was initially unknown. It is referred to under the term SARS. In the beginning, it spread in some regions South-East Asia. Import infections appeared in many other parts of the world. Based on the first cases in Germany, this report illustrates the clinical appearance, the diagnostic results and the management of this new disease.

Patients and methods: We analysed the data of two patients with SARS and one suspected patient. The results of radiological, laboratory, micobiological and physical examinations were abstracted and compared with the data obtained in other regions.

Results: Two of the three patients under our care developed SARS disease. This is characterised by fever of sudden onset lasting for more than 5 days, rapidly changing consolidations in chest x-ray not affected by antimicrobial therapy, leuco-, lympho- as well as thrombopenia with a compromised pulmonary function later in the course. Close contacts with SARS patients does not regularly result in full development of the disease. Secretion of a coronavirus could be detected in respiratory samples during the febrile phase and in feces for a longer time. It is still an open question whether bedrest and antibiotic prophylaxis by themselves or an additional administration of ribavirin and corticosteroids can improve the outcome. Conclusion: SARS is a new and highly contagious lung disease. It is crucial to be able to recognize the clinical appearance and the diagnostic features of this disease at an early stage, in order to prevent a further dissemination of the disease.

# Title: Deutscher Dokumentartag 1987. Von der Information zum Wissen, von Wissen zur Information: Traditionelle und Moderne Informationssysteme fur Wissenschaft und Praxis (German Documentation 1987. From Information to Knowledge, from Knowledge to Information: Traditional and Modern Information Systems for Knowledge and Practice)

Full Journal Title: Deutscher Dokumentartag 1987. Von der Information zum Wissen, von Wissen zur Information: Traditionelle und Moderne Informationssysteme fur Wissenschaft und Praxis (German Documentation 1987. From Information to Knowledge, from Knowledge to Information: Traditional and Modern Information Systems for Knowledge and Practice)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language: English

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? von Keitz, W. (1988), Scientometric analysis of online collected data pools by means of the EXTRACT-SHOW computer program. *Deutscher Dokumentartag 1987. Von der Information zum Wissen, von Wissen zur Information: Traditionelle und Moderne Informationssysteme fur Wissenschaft und Praxis (German Documentation 1987. From Information to Knowledge, from Knowledge to Information: Traditional and Modern Information Systems for Knowledge and Practice)*, 202-220.

Abstract: Relates scientometry and information science, lists the commands available in the EXTRACT-SHOW program language, and shows how document distribution analyses in particular fields can be prepared. Frequency of occurrence is obtained, and statistical analysis is explained on the basis of samples. An example of searching for a particular chemical substance mentioned in cancer research is presented. Future trends in scientometry are noted.

Keywords: Analyses, Analysis, Cancer, Chemical, Data, Distribution, Information, Information Science, Research, Science, Scientometry, Statistical Analysis, Trends

# Title: Deutsches Arzteblatt International

Full Journal Title: Deutsches Arzteblatt International

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Baethge, C. (2008), First Authors in Deutsches Ärzteblatt: Women are catching up. The number of female authors in medical literature is increasing, but is still considerably lower than that of male authors and corresponds to the proportion of women working in academic medicine. *Deutsches Arzteblatt International*, **105** (28-29), 507-509.

Full Text: [2008\Deu Arz Int105, 507.pdf](2008/Deu%20Arz%20Int105,%20507.pdf)

Keywords: Gender, Medicine, Physicians

? Letzel, S. (2009), Lead poisoning due to adulterated marijuana in leipzig indication for chelator therapy should be defined critically incorrectly cited. *Deutsches Arzteblatt International*, **106** (28-29), 479.

Full Text: [2009\Deu Arz Int106, 479.pdf](2009/Deu%20Arz%20Int106,%20479.pdf)

Keywords: Lead

? Mertens, S. (2010), Spotlight on plagiarism. *Deutsches Arzteblatt International*, **107** (49), 863-865

Full Text: 2010\Deu Arz Int107, 863.pdf

Keywords: Citations, Duplicate Publications, Plagiarism

# Title: Developing World Bioethics

Full Journal Title: Developing World Bioethics

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zeng, W.Q. and Resnik, D. (2010), Research integrity in China: Problems and prospects. *Developing World Bioethics*, **10** (3), 164-171.

Abstract: In little more than 30 years, China has recovered from the intellectual stagnation brought about by the Cultural Revolution to become a global leader in science and technology. Like other leading countries in science and technology, China has encountered some ethical problems related to the conduct of research. China’s leaders have taken some steps to respond to these problems, such as developing ethics policies and establishing oversight committees. To keep moving forward, China needs to continue to take effective action to promote research integrity. Some of the challenges China faces include additional policy development, promoting education in responsible conduct of research, protecting whistle-blowers, and cultivating an ethical research environment.

Keywords: China, Conduct, Development, Education, Environment, Ethics, Fraud, Lessons, Misconduct, Plagiarism, Policies, Policy, Research, Research Ethics, Research Integrity, Science, Scientific Misconduct

? Wonkam, A., Kenfack, M.A., Muna, W.F.T. and Ouwe-Missi-Oukem-Boyer, O. (2011), Ethics of human genetic studies in sub-saharan Africa: The case of Cameroon through a bibliometric analysis. *Developing World Bioethics*, **11** (3), 120-127.

Full Text: [2011\Dev Wor Bio11, 120.pdf](2011/Dev%20Wor%20Bio11,%20120.pdf)

Abstract: Many ethical concerns surrounding human genetics studies remain unresolved. We report here the situation in Cameroon. Objectives: To describe the profile of human genetic studies that used Cameroonian DNA samples, with specific focus on i) the research centres that were involved, ii) authorship, iii) population studied, iv) research topics and v) ethics disclosure, with the aim of raising ethical issues that emerged from these studies. Method: Bibliometric Studies; we conducted a PubMed-based systematic review of all the studies on human genetics that used Cameroonian DNA samples from 1989 to 2009. Results and Discussion: Fifty articles were identified, involving predominantly research centres from Europe (64%) and America (32%). Only 7 (14%) Cameroonian institutions and 14 (28%) Cameroonian authors were associated with these publications. At least 52% of publications were devoted to population genetics (variation/migration patterns) amongst 30 Cameroonian ethnic groups. Very few studies concerned public health related genetic issues and only 5 (10%) references were found for hemoglobinopathies like sickle cell anaemia. Almost all DNA samples are ‘banked’ outside of the African continent. Capacity building, rights to the genetic information and benefits to the individuals, communities and populations who contribute to these studies are addressed. Conclusions: 1) Our data suggests the need for a wider debate towards building capacity and addressing ethical issues related to human genomic research in sub-Saharan Africa and specifically in Cameroon; 2) National ethical guidelines and regulations concerning the collection, use and storage of human DNA are urgently needed in Cameroon.

Keywords: Africa, Anaemia, Authors, Authorship, Benefit, Bibliometric, Bibliometric Studies, Cameroon, Capacity, Capacity Building, Challenges, Developing-Countries, Disclosure, DNA, DNA Samples, Ethical Concerns, Ethics, Europe, Genetic, Genetic Information, Genetics, Genome-Project, Guidelines, History, Human, Human Genetics, Information, Participation, Perceptions, Physicians, Population Genetics, Profile, Public Health, Publications, Research, Research Topics, Review, Services, Society, Sub-Saharan Africa, Systematic, Systematic Review, Topics

# Title: Development

Full Journal Title: [Development](http://dev.biologists.org/)

ISO Abbreviated Title: Development

JCR Abbreviated Title: Development

ISSN: 0950-1991

Issues/Year:

Journal Country/Territory:

Language: English

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Benjamin, L.E., Hemo, I. and Keshet, E. (1998), A plasticity window for blood vessel remodelling is defined by pericyte coverage of the preformed endothelial network and is regulated by PDGF-B and VEGF. *Development*, **125** (9), 1591-1598.

Full Text: [1998\Development125, 1591.pdf](1998/Development125,%201591.pdf)

Abstract: Little is known about how the initial endothelial plexus is remodelled into a mature and functioning vascular network, Studying postnatal remodelling of the retina vasculature, we show that a critical step in vascular maturation, namely pericyte recruitment, proceeds by outmigration of cells positive for alpha-smooth muscle actin from arterioles and that coverage of primary and smaller branches lags many days behind formation of the endothelial plexus, The transient existence of a pericyte-free endothelial plexus coincides temporally and spatially with the process of hyperoxia-induced vascular pruning, which is a mechanism for fine tuning of vascular density according to available oxygen. Acquisition of a pericyte coating marks the end of this plasticity window.

To substantiate that association with pericytes stabilizes the vasculature, endothelial-pericyte associations were disrupted by intraocular injection of PDGF-BB. Ectopic PDGF-BB caused the detachment of PDGF-beta receptor-positive pericytes from newly coated vessels, presumably through interference with endogenous cues, but had no effect on mature vessels, Disruption of endothelial-pericyte associations resulted in excessive regression of vascular loops and abnormal remodelling, Conversely, intraocular injection of VEGF accelerated pericyte coverage of the preformed endothelial plexus, thereby revealing a novel function of this pleiotropic angiogenic growth factor. These findings also provide a cellular basis for clinical observations that vascular regression in premature neonates subjected to oxygen therapy [i.e. in retinopathy of prematurity] drops precipitously upon maturation of retina vessels and a mechanistic explanation to our previous findings that VEGF can rescue immature vessels from hyperoxia-induced regression.

Keywords: Blood Vessel, Rat, Vascular System, Pericyte, Angiogenesis, Vegf Pdgfb, Smooth-Muscle Cells, Receptor Tyrosine Kinase, Integrin Alpha(V)Beta(3), Growth, Angiogenesis, Survival, Hypoxia, Retinopathy, Prematurity, Inhibition

# Title: Development Policy Review

Full Journal Title: Development Policy Review

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zuccala, A. and van Eck, N.J. (2011), Poverty research in a development policy context. *Development Policy Review*, **29** (3), 311-330.

Full Text: [2011\Dev Pol Rev29, 311.pdf](2011/Dev%20Pol%20Rev29,%20311.pdf)

Abstract: This article provides an evaluation of the extent to which science is addressing worldwide poverty and hunger. It is based on the literature contained in the Thomson Reuters’ Web of Science Citation Index (1980 to 2008) and focuses on the WOTRO Strategy Plan 2007-2010 of the Netherlands Foundation for the Advancement of Tropical Research, although similar policies from other countries might also be assessed. The data show that poverty/hunger research has grown steadily over time in many disciplines, most significantly in Environmental Sciences and Technology. Much of this research is hidden; hence the construction of an internationally recognised open-access database is recommended so that scientists can easily identify critical gaps related to scientific capacity-building.

Keywords: Capacity Building, Citation, Comparative Advantage, Construction, Data, Database, Economic-Development, Environmental, Evaluation, Exports, Hunger, Industrial-Policy, Literature, Model, Open Access, Open Access to Scientific Literature, Policies, Policy, Poverty, Poverty Research, Research, Science, Science and Development Policy, Science Citation Index, Soft Budget Constraint, The Netherlands, Thomson-Reuters, Trade, Web of Science

# Title: Developmental Medicine and Child Neurology

Full Journal Title: Developmental Medicine and Child Neurology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Gobets, D., Beckerman, H., de Groot, V., van Doorn-Loogman, M.H. and Becher, J.G. (2010), Indications and effects of botulinum toxin A for obstetric brachial plexus injury: A systematic literature review. *Developmental Medicine and Child Neurology*, **52** (6), 517-528.

Abstract: Aim To give an overview of indications for the use of botulinum toxin A (BoNT-A) treatment for children with obstetric brachial plexus injury (OBPI), and to present the best available evidence of the effectiveness of this treatment. Method Searches were performed in Cinahl, Cochrane Library, EMBASE, PUBMED, and Web of Science, using the keywords ‘botulinum’ and ‘plexus’, to identify articles reporting on the use of BoNT-A as a treatment for children with OBPI. Studies found through the references of related articles were also selected. Results Ten full-text papers and six congress abstracts were included, involving 343 children. Four groups of indications could be identified: internal rotation/adduction contracture of the shoulder, limited active elbow flexion, limited active elbow extension, and pronation contracture of the lower arm. Overall, positive results were reported for all except the indication for limited active elbow extension. However, only one study was comparative in nature; all others were classified as having a low level of evidence. There was a large variation in outcome measures. Interpretation To provide better evidence for the already partly promising results of BoNT-A treatment for children with OBPI, multicentre randomized controlled trials are needed.

Keywords: Birth Injuries, Cerebral-Palsy, Children, Cochrane, Cocontractions, Effectiveness, Indications, Injury, Lesions, Literature, Literature Review, Management, Outcome, Overview, Papers, Prognosis, Pubmed, Randomized Controlled Trials, Review, Risk-Factors, Science, Shoulder, Spasticity, Systematic, Systematic Literature Review, Treatment, Web of Science

? Grunt, S., Becher, J.G. and Vermeulen, R.J. (2011), Long-term outcome and adverse effects of selective dorsal rhizotomy in children with cerebral palsy: A systematic review. *Developmental Medicine and Child Neurology*, **53** (6), 490-498.

Abstract: Aim To assess the long-term outcome and adverse events of selective dorsal rhizotomy (SDR) in children with spastic cerebral palsy (CP). Method Studies were selected based on the following inclusion criteria: children with CP that underwent SDR with a follow-up period of at least 5 years. The following databases were searched: MEDLINE, Web of Science, EMBASE, PEDro, and the Cochrane library. Studies meeting the inclusion criteria were scored by two reviewers, who graded the level of evidence and the quality/conduct of the studies. Outcomes were classified according to the International Classification of Functioning, Disability and Health (ICF). Results Only three of the 21 studies who met the inclusion criteria allowed a tentative conclusion on outcome. There is moderate evidence that SDR has a positive long-term influence on the ICF body structure and body function domains but there is no evidence that SDR has an influence on the ICF activity and participation domains. Spinal abnormalities seem to be common, but no conclusion can be drawn about their relation to SDR. Interpretation There is lack of evidence concerning the long-term outcomes after SDR. Future studies need to clarify the long-term influence of SDR - especially in the ICF domains of activity and participation.

Keywords: Adverse Effects, Cerebral Palsy, Children, Classification, Cochrane, Databases, Disability, Follow-Up, Gross Motor Function, Health, Long-Term Outcome, Medline, Orthopedic-Surgery, Outcome, Outcomes, Physiotherapy, Posterior Rhizotomy, Randomized Clinical-Trial, Review, Science, Spasticity, Spinal Deformity, Systematic, Systematic Review, Validated Evaluative Measure, Web of Science

# Title: Developmental Psychobiology

Full Journal Title: [Developmental Psychobiology](http://www3.interscience.wiley.com/journal/29287/home)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bacher, L.F., Romm, R., Spanier, H., Tellefsen, L., Yip, S. and Smotherman, W.P. (2000), *Developmental Psychobiology*: A look back on 30 years. *Developmental Psychobiology*, **37** (1), 1-4.

Full Text: [2000\Dev Psy37, 1.pdf](2000/Dev%20Psy37,%201.pdf)

Abstract: Developmental Psychobiology publishes papers from the disciplines of psychology, biology, neuroscience, and medicine that contribute to an understanding of behavioral development. Research focuses on development in the embryo/fetus, neonate, juvenile, and adult as well as multidisciplinary research that relates behavioral development to anatomy physiology, biochemistry genetics, and evolution. The journal represents a broad phylogenetic perspective on behavioral development by including studies on invertebrates, fish, birds, non-human primates, and humans. This paper presents an analysis of empirical articles published since its first issue in 1968. This analysis covers number of authors, sex of first author evidence of grant support, and participation of investigators from outside the US. Additionally, the analysis includes the topic of research, level of analysis, and subject of experimental study. Over its 32-year history, Developmental Psychobiology has published papers on a wide range of topics representing a broad phylogenetic perspective, with a continued focus on behavioral investigation. This analysis revealed trends such as an increase in the number of studies at a physiology/anatomy level, an increase in studies with human subjects, and increases in contributions from investigators outside of the United States as well as women. (C) 2000 John Wiley & Sons, Inc.

Keywords: Adult, Analysis, Anatomy, Biochemistry, Biology, Birds, Development, Evidence, Evolution, Experimental, First, Fish, Genetics, History, Human, Humans, Invertebrates, Investigation, Journal, Medicine, Multidisciplinary, Neonate, Papers, Participation, Physiology, Psychology, Research, Sex, Support, Trends, Understanding, United States, US, Women

# Title: Developmental Review

Full Journal Title: Developmental Review

ISO Abbreviated Title: Dev. Rev.

JCR Abbreviated Title: Dev Rev

ISSN: 0273-2297

Issues/Year: 4

Journal Country/Territory: United States

Language: English

Publisher: Academic Press Inc

Publisher Address: 525 B St, Ste 1900, San Diego, CA 92101-4495

Subject Categories

Psychology, Developmental: Impact Factor 1.839, / (2001)

Howard, G.S. and Day, J.D. (1995), Individual productivity and impact in developmental psychology. *Developmental Review*, **15** (2), 136-149.

Full Text: [D\Dev Rev15, 136.pdf](D/Dev%20Rev15,%20136.pdf)

Abstract: Individual eminence in developmental psychology was examined through a textbook citation analysis conducted on 10 current textbooks. For the 285 leading authors in this textbook citation study, data on individual research productivity in psychology (from 1983 to 1991) and on a subset of six journals of special importance for developmental psychology were obtained from the PsycLIT data base. An estimate of the scholarly impact of these authors was obtained from citation counts from the 1988-1991 volumes of the Social Sciences Citation Index (SSCI). The diversity of research interests (e.g., cognitive and social development, public policy) and age groups currently studied by developmental psychologists are reflected in the list of top contributors. The development of the discipline could be described through future productivity studies such as this one.

# Title: Developmental Science

Full Journal Title: Developmental Science

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language: English

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Olson, K.R. and Shaw, A. (2011), ‘No fair, copycat!’: What children’s response to plagiarism tells us about their understanding of ideas. *Developmental Science*, **14** (2), 431-439.

Abstract: Adults believe that plagiarizing ideas is wrong, which requires an understanding that others can have ideas and that it is wrong to copy them. In order to test when this understanding emerges, we investigated when children begin to think plagiarism is wrong. In Study 1, children aged 7, 9 and 11 years old, as well as adults, disliked someone who plagiarized compared to someone who drew an original drawing or someone who drew an identical picture by chance. Study 2 investigated the same question with younger children, focusing on children aged 3-6 years old. Children aged 5-6 years old evaluated plagiarizers negatively relative to unique drawers, but 3-4-year-olds did not. Study 3 replicated the findings from Study 2 and found that children justify their negative evaluations of plagiarizers by mentioning concerns over copying. These experiments provide evidence that, by age 5 years old, children understand that others have ideas and dislike the copying of these ideas.

Keywords: Children, Infer Ownership, Peers, Plagiarism, Possession

# Title: Developments in Biological Standardization

Full Journal Title: Developments in Biological Standardization

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories

: Impact Factor

? Beasley, R.P., Hwang, L.Y., Lin, C.C. and Chien, C.S. (1983), Hepatocellular-carcinoma and hepatitis-B virus: The Taiwan prospective study of 22707 men. *Developments in Biological Standardization*, **54**, 523-524.

Full Text: 1983\Dev Rev54, 523.pdf

# Title: Developments in Chemical Engineering and Mineral Processing

(Dev. Chem. Eng. Mineral Process)

McKay, G. (1996), Peat for environmental applications: A review. *Developments in Chemical Engineering and Mineral Processing*, **4**, 127-155.

Allen, S.J., Whitten, L. and McKay, G. (1996), The production and Characterisation of activated carbon: A review. *Developments in Chemical Engineering and Mineral Processing*, **6**, 231-261.

# Title: Diabetes

Full Journal Title: Diabetes

ISO Abbreviated Title: Diabetes

JCR Abbreviated Title: Diabetes

ISSN:

Issues/Year:

Journal Country/Territory:

Language: English

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? (1965), Diabetes - Related literature index - by authors and by key words in title for year 1962. *Diabetes*, **S 14**, 1-??.

? (1966), Diabetes - Related literature index - by authors and by key words in title for year 1963. *Diabetes*, **S 15**, R2-??.

? (1967), Diabetes - Diabetes-related literature index by authors and by key words in title for year 1964. *Diabetes*, **S 16**, 1-??.

? Haffner, S.M., Valdez, R.A., Hazuda, H.P., Mitchell, B.D., Morales, P.A. and Stern, M.P. (1992), Prospective analysis of the insulin-resistance syndrome (Syndrome-X). *Diabetes*, **41** (6), 715-722.

Full Text: 1992\Diabetes41, 715.pdf

Abstract: Many studies have shown that hyperinsulinemia and/or insulin resistance are related to various metabolic and physiological disorders including hypertension, dyslipidemia, and non-insulin-dependent diabetes mellitus. This syndrome has been termed Syndrome X. An important limitation of previous studies has been that they all have been cross sectional, and thus the presence of insulin resistance could be a consequence of the underlying metabolic disorders rather than its cause. We examined the relationship of fasting insulin concentration (as an indicator of insulin resistance) to the incidence of multiple metabolic abnormalities in the 8-yr follow-up of the cohort enrolled in the San Antonio Heart Study, a population-based study of diabetes and cardiovascular disease in Mexican Americans and non-Hispanic whites. In univariate analyses, fasting insulin was related to the incidence of the following conditions: hypertension, decreased high-density lipoprotein cholesterol concentration, increased triglyceride concentration, and non-insulin-dependent diabetes mellitus. Hyperinsulinemia was not related to increased low-density lipoprotein or total cholesterol concentration. In multivariate analyses, after adjustment for obesity and body fat distribution, fasting insulin continued to be significantly related to the incidence of decreased high-density lipoprotein cholesterol and increased triglyceride concentrations and to the incidence of non-insulin-dependent diabetes mellitus. Baseline insulin concentrations were higher in subjects who subsequently developed multiple metabolic disorders. These results were not attributable to differences in baseline obesity and were similar in Mexican Americans and non-Hispanic whites. These results support the existence of a metabolic syndrome and the relationship of that syndrome to multiple metabolic disorders by showing that elevations of insulin concentration precede the development of numerous metabolic disorders.

Keywords: Dependent Diabetes-Mellitus, Cardiovascular Risk-Factors, Familial Dyslipidemic Hypertension, Mexican-Americans, Plasma-Insulin, Blood-Pressure, Glucose-Tolerance, San-Antonio, Lipoprotein Concentrations, Pima-Indians

? Staels, B. and Fruchart, J.C. (2005), Therapeutic roles of peroxisome proliferator-activated receptor agonists. *Diabetes*, **54** (8), 2460-2470.

Full Text: [2005\Diabetes54, 2460.pdf](2005/Diabetes54,%202460.pdf)

Abstract: Peroxisome proliferator-activated receptors (PPA-Rs) play key roles in the regulation of energy homeostasis and inflammation, and agonists of PPAR alpha and -gamma are. currently used therapeutically. Fibrates, first used in the 1970s for their lipid-modifying properties, were later shown to activate PPARa. These agents lower plasma triglycerides and VLDL particles and increase HDL cholesterol, effects that are associated with cardiovascular benefit. Thiazolidinediones, acting via PPAR gamma, influence free fatty acid flux and thus reduce insulin resistance and blood glucose levels. PPAR gamma agonists are therefore used to treat type 2 diabetes. PPAR alpha and -gamma agonists also affect inflammation, vascular function, and vascular remodeling. As knowledge of the pleiotropic effects of these agents advances, further potential indications are being revealed, including roles in the management of cardiovascular disease (CVD) and the metabolic syndrome. Dual PPAR alpha/gamma agonists (currently in development) look set to combine the properties of thiazolidinediones and fibrates, and they hold considerable promise for improving the management of type 2 diabetes and providing an effective therapeutic option for treating the multifactorial components of CVD and the metabolic syndrome. The functions of a third PPAR isoform, PPAR delta, and its potential as a therapeutic target are currently under investigation.

Keywords: Type-2 Diabetes-Mellitus, Coronary-Artery-Disease, C-Reactive Protein, Vascular Endothelial-Cells, Intervention Trial Becait, Tissue Factor Expression, Low-Density-Lipoprotein, Ppar-Alpha Activators, Cardiovascular-Disease, Insulin-Resistance

# Title: Diabetes Care

Full Journal Title: Diabetes Care

ISO Abbreviated Title: Diabetes Care

JCR Abbreviated Title: Diabetes Care

ISSN: 0149-5992

Issues/Year: 10

Journal Country/Territory: United States

Language: English

Publisher: Amer Diabetes Assoc

Publisher Address: 1660 Duke St, Alexandria, VA 22314

Subject Categories:

Endocrinology & Metabolism: Impact Factor

? (1993), Responsible use of animals in research (reprinted from diabetes care, Vol 8, pg 410, 1985). *Diabetes Care*, **16** (5), S2, 44.

? Kaufman, F.R. and Devgan, S. (1995), An increase in newly onset IDDM admissions following the Los Angeles earthquake. *Diabetes Care*, **18** (3), 422.

Burgers, J.S., Bailey, J.V., Klazinga, N.S., Van der Bij, A.K., Grol, R. and Feder, G. (2002), Inside Guidelines: Comparative analysis of recommendations and evidence in diabetes guidelines from 13 countries. *Diabetes Care*, **25** (3), 1933-1939.

Full Text: [D\Dia Car25, 1933.pdf](D/Dia%20Car25,%201933.pdf)

Abstract: OBJECTIVE—To compare guidelines on diabetes from different countries in order to examine whether differences in recommendations could be explained by use of different research evidence.

RESEARCH DESIGN and METHODS—We analyzed 15 clinical guidelines on type 2 diabetes from 13 countries using qualitative methods to compare the recommendations and bibliometric methods to measure the extent of overlap in citations used by different guidelines. A further qualitative analysis of recommendations and cited evidence for two specific issues in diabetes care explored the apparent discrepancy between recommendations and evidence.

RESULTS—The recommendations made in the guidelines were in agreement about the general management of type 2 diabetes, with some important differences in treatment details. There was little overlap in evidence cited by the guidelines, with 18% (185/1, 033) of citations shared with any other guideline, and only 10 studies (1%) appearing in six or more guidelines. The measurable overlap in evidence between guidelines increases if multiple publications from the same study and the use of reviews are taken into account. Research originating from the U.S. predominated (40% of citations), however, nearly all (11/12) guidelines were significantly more likely to cite evidence originating from their own countries.

CONCLUSIONS—Despite the variation in cited evidence and preferential citation of evidence from a guideline’s country of origin, we found a high degree of international consensus in recommendations made for the clinical care of type 2 diabetes. The influence of professional bodies such as the American Diabetes Association may be an important factor in explaining international consensus. Globalization of recommended management of diabetes is not a simple consequence of the globalization of research evidence.

Abbreviations: ADA, American Diabetes Association, AGREE, Appraisal of Guidelines for Research and Evaluation, DCCT, Diabetes Control and Complications Trial, UKPDS, U.K. Prospective Diabetes Study

Keywords: Blood-Glucose Control, Care, Clinical-Practice Guidelines, Hypertension, Implementation, Mellitus, Microvascular Complications, Progression, Risk, Systematic Reviews

? Cardwell, C.R., Shields, M.D., Carson, D.J. and Patterson, C.C. (2003), A meta-analysis of the association between childhood type 1 diabetes and atopic disease. *Diabetes Care*, **26** (9), 2568-2574.

Abstract: OBJECTIVE - To review the published literature and perform a meta-analysis summarizing the evidence in support of an inverse association between type I diabetes and the atopic disorders: asthma, eczema, and allergic rhinitis in children. RESEARCH DESIGN AND METHODS - MEDLINE, Web of Science, and PUBMED were searched to identify relevant studies. These were assessed on quality criteria, and odds ratios (ORs) and 95% CIS were calculated for each study from the reported prevalences of atopy in children with diabetes and in control children. Meta-analysis was then used to derive a combined OR and test for heterogeneity in findings between studies. RESULTS - Twenty-five studies were identified. Heterogeneity in the findings from different studies was evident but was considerably reduced when the asthma and rhinitis analyses were restricted to those studies judged to be of adequate design. The meta-analysis revealed an inverse association between asthma and type I diabetes, but the finding only attained significance when analysis was restricted to the studies of adequate design (OR 0.82, 95% CI 0.68-0.99). In this subset an association of similar magnitude was observed between eczema and type 1 diabetes (0.82,0.62-1.10) although this failed to attain statistical significance, and heterogeneity between studies was still present. There was little evidence of an association between rhinitis and type I diabetes (0.97, 0.82-1.16) in this subset of studies. CONCLUSIONS - our analysis suggests that there is a small but significant reduction in the prevalence of asthma in children with type 1 diabetes, but the findings for the other atopic diseases are less conclusive.

Keywords: Allergic Rhinitis, Analysis, Asthma, Bias, Children, Control, Decreased Prevalence, Design, Diabetes, Disease, Eczema, Epidemiology, Hygiene Hypothesis, Inverse Relationship, Literature, Medline, Mellitus, Meta Analysis, Meta-Analysis, Prevalence, Pubmed, Research, Review, Rheumatoid-Arthritis, Science, Statistical, Symptoms, Type 1, Type 1 Diabetes, Web of Science

? Kirk, J.K., D’Agostino, R.B., Bell, R.A., Passmore, L.V., Bonds, D.E., Karter, A.J. and Narayan, K.M.V. (2006), Disparities in HbA(1c) levels between African-American and non-Hispanic white adults with diabetes: A meta-analysis. *Diabetes Care*, **29** (9), 2130-2136.

Abstract: OBJECTIVE - Among individuals with diabetes, a comparison of HbA(1c), (A1C) levels between African Americans and non-Hispanic whites was evaluated. Data sources included PUBMED, Web of Science, the Cumulative Index to Nursing and Allied Health, the Cochrane Library, the Combined Health Information Database, and the Education Resources Information Center. RESEARCH DESIGN AND METHODS - We executed a search for articles published between 1993 and 2005. Data on sample size, age, sex, A1C, geographical location, and study design were extracted. Cross-sectional data and baseline data from clinical trials and cohort studies for African Americans and non-Hispanic whites with diabetes were included. Diabetic subjects aged < 18 years and those with pre-diabetes or gestational diabetes were excluded. We conducted a meta-analysis to estimate the difference in the mean values of A1C for African Americans and non-Hispanic whites. RESULTS - A total of 391 studies were reviewed, of which 78 contained A1C data. Eleven had data on A1C for African Americans and non-Hispanic whites and met selection criteria. A meta-analysis revealed the standard effect to be 0.31 (95% CI 0.39-0.25). This standard effect correlates to an A1C difference between groups of similar to 0.65%, indicating a higher A1C across studies for African Americans. Grouping studies by study type (cross-sectional or cohort), method of data collection for A1C (chart review or blood draw), and insurance status (managed care or nonmanaged care) showed similar results. CONCLUSIONS - The higher A1C observed in this meta-analysis among African Americans compared with non-Hispanic whites may contribute to disparity in diabetes morbidity and mortality in this population.

Keywords: Adults, African American, Aged, Blood, Clinical Trials, Cochrane, Cohort Studies, Correlates, Data Collection, Design, Diabetes, Disparities, Disparity, Education, Ethnic Disparities, Fetal-Hemoglobin, Gestational Diabetes, Glycemic Control, Health, Health-Insurance Coverage, Managed Care, Managed-Care, Meta-Analysis, Mexican-Americans, Morbidity, Mortality, Nursing, Pubmed, Quality-of-Care, Racial-Differences, Research, Review, Science, Stage Renal-Disease, United-States, Web of Science

? Kirk, J.K., Passmore, L.V., Bell, R.A., Narayan, K.M.V., D’Agostino, R.B., Arcury, T.A. and Quandt, S.A. (2008), Disparities in A1C levels between hispanic and non-hispanic white adults with diabetes a meta-analysis. *Diabetes Care*, **31** (2), 240-246.

Abstract: OBJECTIVE - Hispanics have higher rates of diabetes and diabetes-related complications than do non-Hispanic whites. A meta-analysis was conducted to estimate the difference between the mean Values of A1C for these two groups. RESEARCH DESIGN AND METHODS - We executed a PUBMED search of articles published from 1993 through July 2007. Data sources included PUBMED, Web of Science, Cumulative Index to Nursing and Allied Health, the Cochrane Library, Combined Health Information Database, and Education Resources Information Center. Data on sample size, age, sex, A1C, geographical location, and Study design were extracted. Cross-sectional data and baseline data from clinical trials and cohort studies for Hispanics and non-Hispanic whites With diabetes were included. Studies were excluded if they included individuals < 18 years of age or patients with pre-diabetes or gestational diabetes. RESULTS - A total of 495 Studies were reviewed, of which 73 contained data on A1C for Hispanics and non-Hispanic whites, and I I met the inclusion criteria. Meta-analysis revealed a statistically significant mean difference (P < 0.0001) of -0.46 (95% CI -0.63 to -0.33), correlating to an similar to 0.5% higher A1C for Hispanics. Grouping Studies by design (cross-sectional or cohort), Method of data collection for A1C (chart review or blood sampling), and care type (managed or nonmanaged) yielded similar results. CONCLUSIONS - in this meta-analysis, A1C was similar to 0.5% higher in Hispanic patients With diabetes than in non-Hispanic patients. Understanding the reasons for this disparity should be a focus for future research.

Keywords: Adults, Blood, Clinical Trials, Clinical-Outcomes, Cochrane, Cohort Studies, Data Collection, Design, Diabetes, Disparities, Disparity, Education, Ethnic-Differences, Gestational Diabetes, Glycemic Control, Health, Hemoglobin A(1C), Managed Care, Mellitus, Meta Analysis, Meta-Analysis, Mexican-Americans, Nursing, Population, Pubmed, Quality-Of-Care, Research, Review, Science, Type-2, Web of Science

? Calvin, A.D., Aggarwal, N.R., Murad, M.H., Shi, Q., Elamin, M.B., Geske, J.B., Fernandez-Balsells, M.M., Albuquerque, F.N., Lampropulos, J.F., Erwin, P.J., Smith, S.A. and Montori, V.M. (2009), Aspirin for the primary prevention of cardiovascular events: A systematic review and meta-analysis comparing patients with and without diabetes. *Diabetes Care*, **32** (12), 2300-2306.

Abstract: OBJECTIVE - The negative results of two randomized controlled trials (RCTs) have challenged current guideline recommendations for using aspirin for primary prevention of cardiovascular events among patients with diabetes. We therefore sought to determine if the effect of aspirin for primary prevention of cardiovascular events and mortality differs between patients with and without diabetes. RESEARCH DESIGN AND METHODS - We conducted a systematic search of MEDLINE, EMBASE, Cochrane Library, Web of Science, and Scopus since their inceptions until November 2008 for RCTs of aspirin for primary prevention of cardiovascular events. Blinded pairs of reviewers evaluated studies and extracted data. Random-effects meta-analysis and Bayesian logistic regression were used to estimate the ratios of relative risks (RRs) of outcomes of interest among patients with and without diabetes. A 95% Cl that crosses 1.00 indicates that the effect of aspirin does not differ between patients With and without diabetes. RESULTS - Nine RCTs with moderate to high methodological quality contributed data to the analyses. The ratios of RRs comparing the benefit of aspirin among patients with diabetes compared with patients without diabetes for mortality, myocardial infarction, and ischemic stroke were 1.12 (95% CI 0.92-1.35), 1.19 (0.82-1.17), and 0.70 (0.25-1.97), respectively. CONCLUSIONS - Whereas estimates of benefit among patients with diabetes remain imprecise, our analysis suggests that the relative benefit of aspirin is similar in patients With and without diabetes.

Keywords: Analysis, Aspirin, Cardiovascular, Cochrane, Design, Diabetes, Disease, Embase, Interest, Low-Dose Aspirin, Medline, Mellitus, Meta-Analysis, Mortality, Myocardial Infarction, Outcomes, Placebo-Controlled Trial, Prevention, Primary, Primary Prevention, Randomized Controlled Trials, Randomized Controlled-Trials, Research, Review, Science, Scopus, Stroke, Systematic, Systematic Review, Task-Force, Web of Science

# Title: Diabetes Educator

Full Journal Title: Diabetes Educator

ISO Abbreviated Title:

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IDS Number:

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Inst Sci Inform Inc, Philadelphia

Publisher Address:

Subject Categories:

: Impact Factor

? Parkin, C.G., Hinnen, D., Campbell, R.K., Geil, P., Tetrick, D.L. and Polonsky, W.H. (2009), Effective use of paired testing in type 2 diabetes practical applications in clinical practice. *Diabetes Educator*, **35** (6), 915-927.

Abstract: Purpose The purpose of this article is to discuss practical approaches to the use of self-monitoring of blood glucose (SMBG) in clinical practice using paired glucose testing. A rationale for SMBG use and innovative tools for data collection and analysis are presented. Method Health care professionals from various medical specialties collaborated to review current evidence regarding the value and utility of SMBG and to formulate professional opinions regarding use of SMBG. The literature review included key SMBG studies from 2002 through 2009. Established guidelines, position papers, and other evidence were also reviewed for this report. Reference Manager Software was used to search ISI Web of Science, PUBMED, and Z39.50 site databases. Results Although the utility of SMBG in non-insulin-treated type 2 diabetes remains controversial, a recent report from the International Diabetes Federation recommends SMBG use in this population if it is used to educate/motivate individuals and/or monitor and adjust therapy. Health care providers must develop strategies to use SMBG in ways that address these criteria. Conclusions Paired SMBG (testing before/after specific events) promotes diabetes knowledge and self-management skills today’s educator and facilitates assessment of the impact of behavioral changes, medical nutrition therapy, and pharmacologic interventions on glycemic levels. New tools have been developed to assist in using paired testing in clinical practice.

Keywords: Analysis, Assessment, Blood, Blood-Glucose, Data Collection, Databases, Diabetes, Endothelium-Dependent Vasodilation, Guidelines, Health, Hyperglycemia, Impact, Interventions, Intima-Media Thickness, ISI, Knowledge, Literature, Literature Review, Medical, Nutrition, Nutrition Therapy, Pancreatic-Cancer, Papers, Parallel-Group, Patients Beliefs, Postprandial Plasma-Glucose, Practice, Professional, Pubmed, Randomized-Trial, Review, Science, Self-Management, Therapy, Type 2, Type 2 Diabetes, Web of Science

# Title: Diabetes-Metabolism Research and Reviews

Full Journal Title: Diabetes-Metabolism Research and Reviews

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Journal Country/Territory:

Language:

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Subject Categories:

: Impact Factor

? Garduno-Diaz, S.D. and Khokhar, S. (2012), Prevalence, risk factors and complications associated with type 2 diabetes in migrant South Asians. *Diabetes-Metabolism Research and Reviews*, **28** (1), 6-24.

Full Text: [2012\Dia-Met Res Rev28, 6.pdf](file:///H:\Bibliometric%20References\2012\Dia-Met%20Res%20Rev28,%206.pdf)

Abstract: It is estimated that type 2 diabetes (T2D) currently affects about 246 million people worldwide, with South Asians, especially Indians, having both the largest number of cases and the fastest growing prevalence. South Asian ethnicity has been identified as a major risk factor for the development of T2D with central adiposity, insulin resistance and an unfavourable lipid profile being identified as predominant signals of alarm. Leading databases, including Web of Science, Medline, PubMed and Science Direct, were consulted and manual searches were conducted for cited references in leading diabetes-related journals. In all, 152 articles were included for the final assessment reported in this review. Genetic predisposition, central adiposity and unfavourable lifestyle, including physical inactivity and an unhealthy diet, were associated with the prevalence of T2D in migrant South Asians. Westernization, acculturation, socio-economic factors and lack of knowledge about the disease have also been identified as contributors to the development of T2D in this population. Higher prevalence of T2D in migrant South Asians may not be entirely attributed to genetic predisposition; hence, ethnicity and associated modifiable risk factors need further investigation. Preventive measures and appropriate interventions are currently limited by the lack of ethnic-specific cut-off points for anthropometric and biological markers, as well as by the absence of reliable methods for dietary and physical activity assessment. This article describes the prevalence rate, risk factors and complications associated with T2D in migrant South Asians living in different countries. Copyright (C) 2011 John Wiley & Sons, Ltd.

Keywords: 3 Ethnic-Groups, Acculturation, Adiposity, Articles, Assessment, Biological Markers, Body-Fat, C-Reactive Protein, Cardiovascular-Disease, Central Obesity, Complications, Copyright, Coronary-Heart-Disease, Countries, Databases, Development, Diabetes, Diet, Disease, Ethnicity, Genetic, Impaired Glucose-Tolerance, Insulin, Insulin-Resistance, Interventions, Journals, Knowledge, Lipid, Medline, Migrants, People, Physical Activity, Points, Prevalence, Profile, Promoting Physical-Activity, Pubmed, Resistance, Retinopathy, Review, Risk, Risk Factor, Risk Factors, Science, Socioeconomic Factors, South Asians, Type 2, Type 2 Diabetes, Urban-Rural Epidemiology, Web of Science, Web-of-Science

# Title: Diabetes Technology & Therapeutics

Full Journal Title: Diabetes Technology & Therapeutics

ISO Abbreviated Title:

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Language:

Publisher: Inst Sci Inform Inc, Philadelphia

Publisher Address:

Subject Categories:

: Impact Factor

? Asche, C.V., Shane-McWhorter, L. and Raparla, S. (2010), Health economics and compliance of vials/syringes versus pen devices: A review of the evidence. *Diabetes Technology & Therapeutics*, **12** (S1), S101-S108.

Full Text: [2010\Dia Tec The12, S101.pdf](2010/Dia%20Tec%20The12,%20S101.pdf)

Abstract: Background: The goal of this review was to assess the state of the published literature on health economics and compliance of vials/syringes versus pen devices. Methods: A literature search was performed using the Embase search engine for publications that linked drug terms (insulin and insulin lispro) to disease terms (insulin-dependent diabetes mellitus, non-insulin-dependent diabetes mellitus) and other terms (accuracy, article, clinical trial, controlled clinical trial, controlled study, cost benefit analysis, drug delivery system, drug dosage form, drug dosage form comparison, drug dose comparison, drug preference, equipment design, force, glycemic control, healthcare cost, human, insulin treatment, needle, patient attitude, patient compliance, patient safety, torque) along with author keywords (Diabetes, Dose accuracy, FlexPen(R) [Novo Nordisk, Bagsvaerd, Denmark], Insulin, Next Generation FlexPen). Results: The search yielded 39 articles, of which five articles met our study criteria. The focus of the critical outcomes was patient adherence to insulin pen devices versus insulin vials (syringes), hypoglycemic events, emergency department visits due to hypoglycemic events, and costs associated with diabetes and health care. The observation period, mean age of patients, and data sources differed across the studies. The studies indicated that there was an improved adherence with insulin pen devices as opposed to insulin vials (syringes) and that the associated healthcare resource utilization and costs associated with them were found to decrease with the use of pen devices, compared to vials. Conclusions: The use of pen devices improves the health economics benefits and adherence to insulin therapy.

Keywords: Accuracy, Articles, Attitude, Author Keywords, Barriers, Comparison, Costs, Criteria, Dose, Economics, Evidence, Health, Health Care, Human, Impact, Initiation, Insulin, Jun, Literature, Management, Medication Adherence, Outcomes, Publications, Review, Sources, State, Syringe, System, Therapy, Treatment, Type-2 Diabetes-Mellitus

? DeShazo, J., Harris, L. and Pratt, W. (2010), Effective intervention or child’s play? A review of video games for diabetes education. *Diabetes Technology & Therapeutics*, **12** (10), 815-822.

Full Text: 2010\Dia Tec The12, 815.pdf

Abstract: Background: The purpose of this study is (1) to identify diabetes education video games and pilot studies in the literature, (2) to review themes in diabetes video game design and evaluation, and (3) to evaluate the potential role of educational video games in diabetes self-management education. Methods: Studies were systematically identified for inclusion from MEDLINE, Web of Science, CINAHL, EMBASE, Psychinfo, IEEE Xplore, and ACM Digital Library. Features of each video game intervention were reviewed and coded based on an existing taxonomy of diabetes interventions framework. Results: Nine studies featuring 11 video games for diabetes care were identified. Video games for diabetes have typically targeted children with type 1 diabetes mellitus and used situation problem-solving methods to teach diet, exercise, self-monitored blood glucose, and medication adherence. Evaluations have shown positive outcomes in knowledge, disease management adherence, and clinical outcomes. Conclusions: Video games for diabetes education show potential as effective educational interventions. Yet we found that improvements are needed in expanding the target audience, tailoring the intervention, and using theoretical frameworks. In the future, the reach and effectiveness of educational video games for diabetes education could be improved by expanding the target audience beyond juvenile type 1 diabetes mellitus, the use of tailoring, and increased use of theoretical frameworks.

Keywords: Adherence, Blood, Care, Children, Diabetes, Diabetes Mellitus, Disease, Disease Management, Education, Effectiveness, Embase, Evaluation, Exercise, Games, Glycemic Control, Intervention, Interventions, Knowledge, Literature, Management, Medication, Medication Adherence, Mellitus, Methods, Outcomes, Review, Science, Self-Management, Self-Management Education, Type 1, Type 1 Diabetes, Web of Science

? Garg, S., Moser, E., Dain, M.P. and Rodionova, A. (2010), Clinical experience with insulin glargine in type 1 diabetes. *Diabetes Technology & Therapeutics*, **12** (11), 835-846.

Full Text: [2010\Dia Tec The12, 835.pdf](2010/Dia%20Tec%20The12,%20835.pdf)

Abstract: The Diabetes Control and Complications Trial (DCCT) demonstrated the importance of optimal glycemic control achieved through intensive insulin therapy in reducing the microvascular complications associated with type 1 diabetes. However, the DCCT, which was conducted prior to the availability of insulin analogs, also reported a significant increase in severe hypoglycemia with intensive versus conventional therapy. Insulin analogs were developed to aid patients in achieving better diabetes control by providing insulins with optimized pharmacokinetic and pharmacodynamic characteristics. Insulin glargine was the first long-acting insulin analog with a 24-h duration of action, offering once-daily injection, and has now been in clinical use for over 10 years. The authors performed a systematic search of EMBASE, MEDLINE, and Web of Science (Science Citation Index) to determine the efficacy of insulin glargine in type 1 diabetes in basal-bolus insulin regimens. Randomized controlled trials have demonstrated that glycemic control with insulin glargine is at least comparable to that with neutral protamine Hagedorn (NPH) insulin in adults and in children and adolescents, and with continuous subcutaneous insulin infusion in adults. However, these same trials show a significantly lower risk for hypoglycemia with insulin glargine compared with NPH insulin in adults.

Keywords: Acting Insulin, Basal-Bolus Regimen, Citation, Complications, Control, Dawn Phenomenon, Duration, Embase, Fasting Blood-Glucose, Glycemic Control, Insulin Glargine, Long-Term Efficacy, Medline, Multiple Daily Injection, Neutral Protamine Hagedorn, NPH Human Insulin, Randomized Cross-Over, Science, Science Citation Index, Therapy, Web of Science

# Title: Diabetic Medicine

Full Journal Title: Diabetic Medicine

ISO Abbreviated Title:

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Language:

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? Colquitt, J., Royle, P. and Waugh, N. (2003), Are analogue insulins better than soluble in continuous subcutaneous insulin infusion? Results of a meta-analysis. *Diabetic Medicine*, **20** (10), 863-866.

Abstract: Aims The properties of rapid-acting insulin analogues are thought to be particularly appropriate for use in continuous subcutaneous insulin infusion (CSII) or insulin pump therapy. We conducted a systematic review and meta-analysis of trials comparing rapid-acting insulin analogues with soluble insulin in CSII. Methods The following databases were searched (last search June 2002): MEDLINE 1985 - 2002; EMBASE 1980 - 2002; PUBMED internet version, records added June 2001 to June 2002; Science Citation Index 1990 - 2002; BIOSIS 1999 - 2002; Web of Science Proceedings 1990 - 2002; and the Cochrane Library, including DARE and the HTA databases. Randomized controlled trials and crossover studies with at least 10 weeks on each treatment were included. Data extraction and quality assessment were undertaken by one reviewer and checked by a second. A meta-analysis was undertaken using a random effects model. Results A significant improvement of 0.26% (95% confidence interval - 0.47, - 0.06%) in glycated haemoglobin was demonstrated with lispro. Some studies reported fewer hypoglycaemic episodes with analogue insulin but this varied according to the definitions used. No differences in insulin dosage or weight were seen. Two studies reported patient preference, with analogues preferred in both. The extra cost per annum ranges from pound72 (at 40 units per day) to pound150 (at 84 units per day). Conclusions Insulin analogues result in a modest but significant reduction in HbA(1c) compared with soluble insulin when used in CSII, and are preferred by patients.

Keywords: Analogue Insulin, Assessment, Citation, Cochrane, Csii, Databases, Definitions, Glycated Haemoglobin, Haemoglobin, Hypoglycaemia, Insulin, Lispro, Medline, Meta-Analysis, Methods, Model, Pubmed, Pumps, Randomized Controlled Trials, Regular Insulin, Review, Science, Science Citation Index, Systematic, Systematic Review, Therapy, Treatment, Web of Science

? Henry, E.B., Patterson, C.C. and Cardwell, C.R. (2011), A meta-analysis of the association between pre-eclampsia and childhood-onset Type 1 diabetes mellitus. *Diabetic Medicine*, **28** (8), 900-905.

Abstract: Aims To review and synthesize the evidence for an increased risk of childhood Type 1 diabetes mellitus in children born to mothers diagnosed with pre-eclampsia during pregnancy. Methods A comprehensive search of the published literature was performed in MEDLINE, Web of Science and EMBASE limited to studies published before August 2010. Crude odds ratios and 95% confidence intervals were calculated from the data reported in each study. Meta-analysis techniques were then used to derive a combined odds ratio and investigate heterogeneity. Sensitivity analyses were conducted by study design, ascertainment of pre-eclampsia and study quality. Results Data were available from 16 studies including 8315 children with Type 1 diabetes. Overall, there was little evidence of an increase in the risk of Type 1 diabetes in children born to mothers who had pre-eclampsia during pregnancy (OR = 1.10, 95% CI 0.96-1.27; P = 0.17). This association did not vary much between studies (I(2) = 28%, P for heterogeneity = 0.14). The association was similar in three cohort studies (OR = 1.05,95% CI 0.77-1.44; P = 0.75) and in seven studies with a low risk of bias (OR = 1.13, 95% CI 0.91-1.40; P = 0.27), but was more marked in 13 studies which ascertained pre-eclampsia from obstetrical records or birth registry data (OR = 1.18, 95% CI 1.03-1.36; P = 0.02). Conclusions This analysis demonstrates little evidence of any substantial increase in childhood Type 1 diabetes risk after pregnancy complicated by pre-eclampsia.

Keywords: Analysis, Bias, Children, Cohort, Cohort Studies, Confidence Intervals, Diabetes, Diabetes Mellitus, Embase, Epidemiology, Literature, Medline, Meta Analysis, Meta-Analysis, Methods, Mothers, Perinatal Risk-Factors, Pre-Eclampsia, Pregnancy, Ratio, Record Linkage, Review, Risk, Science, Type 1 Diabetes Mellitus, UK, Vitamin-D Supplementation, Web of Science, Yorkshire

# Title: Diabetologia

Full Journal Title: Diabetologia

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Language:

Publisher: Inst Sci Inform Inc, Philadelphia

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Subject Categories:

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? Cardwell, C.R., Stene, L.C., Joner, G., Cinek, O., Svensson, J., Goldacre, M.J., Parslow, R.C., Pozzilli, P., Brigis, G., Stoyanov, D., Urbonaite, B., Sipetic, S., Schober, E., Ionescu-Tirgoviste, C., Devoti, G., de Beaufort, C.E., Buschard, K. and Patterson, C.C. (2008), Caesarean section is associated with an increased risk of childhood-onset type 1 diabetes mellitus: A meta-analysis of observational studies. *Diabetologia*, **51** (5), 726-735.

Abstract: Aims/hypothesis The aim of this study was to investigate the evidence of an increased risk of childhood-onset type 1 diabetes in children born by Caesarean section by systematically reviewing the published literature and performing a meta-analysis with adjustment for recognised confounders. Methods After MEDLINE, Web of Science and EMBASE searches, crude ORs and 95% CIs for type 1 diabetes in children born by Caesarean section were calculated from the data reported in each study. Authors were contacted to facilitate adjustments for potential confounders, either by supplying raw data or calculating adjusted estimates. Meta-analysis techniques were then used to derive combined ORs and to investigate heterogeneity between studies. Results Twenty studies were identified. Overall, there was a significant increase in the risk of type 1 diabetes in children born by Caesarean section (OR 1.23, 95% CI 1.15-1.32, p<0.001). There was little evidence of heterogeneity between studies (p=0.54). Seventeen authors provided raw data or adjusted estimates to facilitate adjustments for potential confounders. In these studies, there was evidence of an increase in diabetes risk with greater birthweight, shorter gestation and greater maternal age. The increased risk of type 1 diabetes after Caesarean section was little altered after adjustment for gestational age, birth weight, maternal age, birth order, breast-feeding and maternal diabetes (adjusted OR 1.19, 95% CI 1.04-1.36, p=0.01). Conclusions/Interpretation This analysis demonstrates a 20% increase in the risk of childhood-onset type 1 diabetes after Caesarean section delivery that cannot be explained by known confounders.

Keywords: Analysis, Authors, Birth-Order, Birthweight, Caesarean Section, Cesarean Section, Children, Delivery, Determinants, Diabetes, Diabetes Mellitus, Embase, Epidemiology, Literature, Medline, Meta Analysis, Meta-Analysis, Methods, Northern-Ireland, Observational Studies, Perinatal Factors, Population-Based Cohort, Record Linkage, Reviewing, Risk, Science, Type 1, Type 1 Diabetes, UK, Web of Science, Yorkshire

? Chida, Y. and Hamer, M. (2008), An association of adverse psychosocial factors with diabetes mellitus: A meta-analytic review of longitudinal cohort studies. *Diabetologia*, **51** (12), 2168-2178.

Abstract: There has been substantial interest in the association between psychosocial stress and risk of diabetes mellitus, but no data on the systematic quantification of the causal relationship have been published. This analysis aims to evaluate the association between adverse psychosocial factors and diabetes mellitus. We performed a search of MEDLINE, PsycINFO, Web of Science and PUBMED up to July 2008. The studies included were prospective cohort studies investigating the association between adverse psychosocial factors and risk of diabetes mellitus. There were 22 relationships between psychosocial factors and disease-related factors (in 14 papers), of which 16 evaluated the associations of adverse psychosocial factors with diabetes control in diabetic populations and six evaluated the associations of adverse psychosocial factors with the incidence of diabetes in populations without any diagnosed diabetes. The overall meta-analysis demonstrated that adverse psychosocial factors were significantly associated with poor diabetes control (combined correlation coefficient, r=0.096, p=0.006), whereas adverse psychosocial factors were not associated with incident diabetes mellitus. More notably, sensitivity analyses showed that low social support was more robustly associated with poor diabetes control than stressful events per se or stress-prone personality or coping style, and that adverse psychosocial factors were associated with poor control of type 1 and type 2 diabetes. The current review revealed a detrimental association of psychosocial factors with the prognosis of both type 1 and type 2 diabetes. However, any aetiological effect of adverse psychosocial factors remains elusive as a result of the small number of individuals enrolled in the cohorts studied.

Keywords: Adherence, Analysis, Autoimmunity, Children, Cohort Studies, Control, Diabetes, Diabetes Mellitus, Improve Glycemic Control, Interest, Life Events, Meta-Analysis, Metabolic-Control, Mind and Body Connection, Papers, Prognosis, Psychological Interventions, Psychoneuroendocrinology, Psychosocial, Psychosocial Stress, Pubmed, Randomized Controlled-Trials, Review, Risk, Science, Social, Stress, Systematic, Type 1, Type 2, Type 2 Diabetes, Web of Science

# Title: Diagnostic and Interventional Radiology

Full Journal Title: [Diagnostic and Interventional Radiology](http://www.dirjournal.org/archive.php3?code=DIR)

ISO Abbreviated Title:

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Language:

Publisher: Inst Sci Inform Inc, Philadelphia

Publisher Address:

Subject Categories:

: Impact Factor

? Akpinar, E. and Karcaaltincaba, M. (2010), Analysis of scientific papers in the field of radiology and medical imaging included in Science Citation Index Expanded and published by Turkish authors. *Diagnostic and Interventional Radiology*, **16** (3), 175-178.

Full Text: [2010\Dia Int Rad16, 175.pdf](2010/Dia%20Int%20Rad16,%20175.pdf)

Abstract: PURPOSE We aimed to analyze scientific papers published by Turkish authors in “radiology, nuclear medicine and medical imaging” journals included in the Science Citation Index Expanded and compared the number of published scientific papers from Turkey and other countries. MATERIALS and METHODS We retrospectively searched all papers published by Turkish authors between 1945 and 2008 by using Web of Science software. We performed the analysis by typing “Turkey” in the address section and all radiology and medical imaging journals in the source title section using the general search function of the software. We further analyzed these results by using “analyze” function of the software according to the number of publications per year, journals, institution and type of papers. We also calculated total number of citations to published scientific papers using citation report function. We analyzed the rank of Turkey among other countries in terms of the number of published papers. RESULTS Overall, 4,532 papers were published between 1945 and 2008. The first paper was published in 1976. Number of publications increased dramatically from 1976 (n = 1) to 2008 (n = 383). The top 5 journals publishing papers from Turkish authors were European Journal of Nuclear Medicine and Molecular Imaging (n = 328), Clinical Nuclear Medicine (n = 296), European Journal of Radiology (n = 289), European Radiology (n = 207) and Journal of Clinical Ultrasound (n = 186). All published papers received 18,419 citations and citation to paper ratio was 4.06. The rank of Turkey among other countries in terms of published papers improved during the last 25 years. CONCLUSION Number of papers from Turkey published in radiology and medical imaging journals has increased at the start of the new millennium. Currently, Turkey is among the top 12 countries when the number of scientific papers published in radiology journals is taken into consideration.

Keywords: American, Citation, Journals, Medicine, Publication, Publications, Radiology, Science Citation Index Expanded, Turkey

# Title: Diagnostic Microbiology and Infectious Disease

Full Journal Title: [Diagnostic Microbiology and Infectious Disease](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5016&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=7aa7b81e389e76930884299abe5f2db0)

ISO Abbreviated Title: Diagn. Microbiol. Infect. Dis.

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Journal Country/Territory: United States

Language: English

Publisher: Elsevier Science Inc

Publisher Address: 655 Avenue of the Americas, New York, NY 10010

Subject Categories:

Infectious Diseases Microbiology: Impact Factor

? Barrett, M.S., Jones, R.N., Erwin, M.E. and Koontz, F.P. (1992), Ci-960 (Pd127391 Or Am-1091), Sparfloxacin, Win-57273, and Isepamicin Activity Against Clinical Isolates of Mycobacterium- Avium-Intracellularae Complex, M-Chelonae, and M-Fortuitum. *Diagnostic Microbiology and Infectious Disease*, **15** (2), 169-171.

Abstract: A 7119 broth microdilution method against CI-960, sparfloxacin, WIN57273, ciprofloxacin, norfloxacin, isepamicin, amikacin, kanamycin, ethambutol, isoniazid, and rifampin was used to test 35 Mycobacterium avium-intracellulare complex (MAI) and five M. chelonae-fortuitum strains. The majority of MAI isolates were inhibited by all tested compounds, with sparfloxacin (MIC90, 0.5 μg g/ml) being the most active among the fluoroquinolones: isepamicin (MIC90, 4 μg g/ml), the most potent aminoglycoside, and isoniazid, rafampin, and ethambutol also demonstrating some degree of activity. Mycobacterium chelonae strains were resistant to all drugs except ciprofloxacin (MIC50, 1 μg/ml). Mycobacterium fortuitum isolates were generally susceptible, especially to the newer fluoroquinolones

Keywords: Amikacin, AT-4140, Ciprofloxacin, Fluoroquinolones, Infections, Invitro Susceptibility, Invivo, Quinolone, Sparfloxacin, Tuberculosis

Franzen, C. and Müller, A. (1999), Cryptosporidia and microsporidia: Waterborne diseases in the immunocompromised host. *Diagnostic Microbiology and Infectious Disease*, **34** (3), 245-262.

Full Text: [D\Dia Mic Inf Dis34, 245.pdf](D/Dia%20Mic%20Inf%20Dis34,%20245.pdf)

Abstract: Cryptosporidia and microsporidia are emerging parasitic pathogens in immunocompetent and immunocompromised individuals. *Cryptosporidium* infects several wild and domestic animals that excrete oocysts into the environment and domestic animals that excrete oocysts into the environment and contaminated water represents the major source of infection for humans. Waterborne transmission of *Cryptosporidium* is a major risk for humans and appropriate measures have to be taken to protect immunocompetent and immunocompromised individuals to become infected. For microsporidia, the sources and ways of transmission are not well documented. Although several animal hosts have been identified recently, the relevant reservoirs of human microsporidia are still unknown. Also, the routes of spreading are unknown. Is microsporidiosis a zoonotic disease that will be transmitted through close contact with infected animals or is contaminated surface water responsible for transmission and represents a relevant reservoir? This review is designed to give information on these two emerging intestinal parasites in a format that will be useful to clinical microbiologists, physicians interested in infectious diseases, and public health personnel. (C) 1999 Elsevier Science Inc.

# Title: Diagnostic Pathology

Full Journal Title:

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Della Mea, V. (2011), 25 years of telepathology research: A bibliometric analysis. *Diagnostic Pathology*, **6**, Article Number: S26.

Full Text: [2011\Dia Pat6, S26.pdf](2011/Dia%20Pat6,%20S26.pdf)

Abstract: Background: The first appearance of the word “telepathology” in a scientific paper can be tracked down to 1986, in a famous editorial of Ronald Weinstein. Since that paper, research in telepathology grew up developing different subfields, including static and dynamic telepathology and more recently virtual microscopy. The present work attempts an analysis of research in telepathology, starting from the tools provided by bibliometrics. Methods: A query has been developed to extract papers related to telepathology and virtual microscopy, and it has been then submitted to Pubmed by means of Entrez Utilities functions. Results obtained in XML have been processed through ad-hoc developed PHP scripts, in order to extract data on Authors, countries, and keywords. Results: On PubMed, 967 papers related to telepathology and virtual microscopy have been retrieved, which involved 2904 Authors; corresponding authors were from 37 countries. Of those authors, 2213 co-authored just one paper. Papers were published on 344 different journals, of which only 52 from the Pathology field. An analysis of papers per year has been also attempted, that demonstrates variable research output in time. Conclusions: From the proposed analysis, telepathology seems to have been consistently studied, in time, by about 400 researchers, with occasional participation of many other people. Telepathology research seems also to have varied in time, although some peaks in paper publishing are certainly related to the proceedings of the European congress on telepathology series, when they have been published on journals. However, some clear sign appears that suggests research in traditional telepathology, after a peak in 2000, showed some decline until virtual microscopy became mainstream, topic that currently pushes research again. The low number of clinical trials calls for more randomized studies in telepathology, to enable evidence-based application.

Keywords: Authors, Bibliometric, Bibliometric Analysis, Bibliometrics, Clinical Trials, Journals, Papers, Publication Output, Publishing, Pubmed, Research, Research Output, Telemedicine

# Title: Diagnostica

Full Journal Title: Diagnostica

ISO Abbreviated Title: Diagnostica

JCR Abbreviated Title: Diagnostica

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Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Eberwein, M., Schui, G. and Krampen, G. (2006), On the development of German-language psychological tests and measures in the 2nd half of the 20th century. *Diagnostica*, **52** (4), 203-211.

Abstract: The electronic data base segment PSYNDEX Tests is produced by the Institute for Psychology Information (ZPID) at the University of Trier. With currently over 5,000 documents, PSYNDEX Tests constitutes the largest test collection in the German-speaking countries. Each data base document is classified according to different criteria, content-wise and formally. Test descriptions offer various possibilities for bibliometric analysis. Here, specific classification categories and the publication year are chosen, regarding psychological and educational tests that were published in a publishing house completely or in parts. Looking at the decades since 1945, the development of German-speaking psychology is reflected in test publishing data, with a boom in psychological-educational tests in the 1970s, the rapid spreading of clinical-psychological diagnostic measures since the same time period, the stagnation of projective procedures since the 1980s, and the rising quality problems in psychological assessment in work, organizational, and personnel psychology.

Keywords: Analysis, Assessment, Base, Bibliometric Analysis, Bibliometrics, Classification, Development, Organizational, Psychological, Psychological Assessment, Psychology, Publication, Publishing, Quality, Science Research, Spreading, Test, Testing, Tests

# Title: Die Casting Engineer

Full Journal Title: Die Casting Engineer

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ISSN: 0012-253X

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Journal Country/Territory: United States

Language: English

Publisher: Die Casting Engineer

Publisher Address: 9701 W Higgins Rd, Suite 880, Rosemont, IL 60018-4721

Subject Categories:

Engineering Metallurgy & Metallurgical Engineering: Impact Factor

? (1998), Patient access to responsible care act (PARCA) HR 1415 S 644. *Die Casting Engineer*, **42** (3), 64 (2 pages).

# Title: Die Makromolekulare Chemie

Full Journal Title: Die Makromolekulare Chemie

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Elias, H.G. (1985), Kinetics of irreversible, stoichiometric polycondensations. *Die Makromolekulare Chemie*, **186** (4), 847-864.

Abstract: Equations are derived for the time dependence of the extent of functional group reaction, *p*A, for catalyzed and uncatalyzed, irreversible, stoichiometric polycondensations of the AB and AA/BB type following pseudo-second-order and third-order chemical kinetics, resp., based on amount-of-substance concentrations. The resulting functions 1/(1 - *p*A) - f(*t*) for pseudo-second-order polycondensations and 1/(1 - *p*A)2 - f(*t*) for third-order polycondensations are predicted to be non-linear for low extents of reaction and practically linear for higher ones which agree with previous, hitherto unexplained experimental observations. The slope of the linear part does not give the true rate constant, contrary to traditional assumptions. The extent of non-linearity at small conversions and the deviation of the apparent rate constant from the true one depends on the initial amount of A groups, the molar mass of the leaving molecules, and the initial mass of the reaction mixture, if the molar concentrations are based on masses (“molalities”). The density of the leaving molecules enters, in addition, if the molar concentrations are volume related (“molarities”). The equations predict, for a given system, that the range of the non-linear region increases with decreasing rate constants, i.e., with decreasing temperature, in accordance with experimental observations.

# Title: Diffusion in Solids, Liquids, Gases

Academic Press, New York

? Jost, W. (1952), *Diffusion in Solids*, *Liquids*, *Gases*, Academic Press, New York.

# Title: Digestion

Full Journal Title: [Digestion](http://content.karger.com/ProdukteDB/produkte.asp?doi=10.1159/000235917)

ISO Abbreviated Title: Digestion

JCR Abbreviated Title: Digestion

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bai, Y., Xu, M.J., Yang, X., Xu, C., Gao, J., Zou, D.W. and Li, Z.S. (2010), A systematic review on intrapyloric botulinum toxin injection for gastroparesis. *Digestion*, **81** (1), 27-34.

Full Text: [2010\Digestion81, 27.pdf](2010/Digestion81,%2027.pdf)

Abstract: Background: Though trials evaluating the effect of intrapyloric botulinum toxin injection on gastroparesis have been reported, there is no agreement whether botulinum toxin can effectively relieve the symptoms and improve the results of gastric emptying study in patients with gastroparesis. We performed a systematic literature review to address this issue. Methods: Databases including PubMed, EMBASE, and the Cochrane Library and Science Citation Index were searched. Two reviewers independently identified relevant trials. Outcome measures were the improvement of subjective symptoms and objective measurement. Results: 15 reports were included; only 2 randomized controlled trials were available. Almost all the non-randomized trials reported significant improvement in subjective symptoms and objective gastric emptying study after botulinum toxin injection. While the 2 randomized controlled trials did not confirm the efficacy of botulinum toxin injection, none of the individual trials showed that there was statistically significant subjective and objective improvement in the active patients when compared with patients receiving placebo. Conclusions: Available high-quality trials showed that intrapyloric botulinum toxin injection could not significantly relieve subjective symptoms and improve objective measurement in patients with gastroparesis, and there is no evidence to recommend botulinum toxin injection for the treatment of gastroparesis. Copyright (C) 2009 S. Karger AG, Basel.

Keywords: Botulinum Toxin, Citation, Clinical-Trials, Controlled-Trials, Databases, Delayed Gastric Emptying, Diabetic Gastroparesis, Diagnosis, Efficacy, Esophagectomy, Gastroparesis, Intrapyloric Botulinum Toxin Injection, Literature, Literature Review, Metaanalysis, Pyloric Injection, Review, Science, Science Citation Index, Sphincter, Symptoms, Systematic Literature Review, Treatment

# Title: Digestive Diseases and Sciences

Full Journal Title: [Digestive Diseases and Sciences](http://www.kluweronline.com/issn/0163-2116/); [Digestive Diseases and Sciences](http://www.springerlink.com/content/101150/?p=e93980f8e3754c8592caa279f65c8da4&pi=0)

ISO Abbreviated Title: Dig. Dis. Sci.

JCR Abbreviated Title: Digest Dis Sci

ISSN: 0163-2116

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Journal Country/Territory: United States

Language: English

Publisher: Kluwer Academic/Plenum Publ

Publisher Address: 233 Spring St, New York, NY 10013

Subject Categories:

Gastroenterology & Hepatology: Impact Factor

? Wu, C.W., Wei, Y.Y., Chi, C.W., Lui, W.Y., Peng, F.K. and Chung, C. (1996), Tissue potassium, selenium, and iron levels associated with gastric-cancer progression. *Digestive Diseases and Sciences*, **41** (1), 119-125.

Full Text: [1996\Dig Dis Sci41, 119.pdf](1996/Dig%20Dis%20Sci41,%20119.pdf)

Abstract: The contents of 10 minor and trace elements in histologically confirmed gastric adenocarcinomas and their corresponding normal gastric mucosal tissues obtained from 39 patients at thetime of gastric resection were simultaneously determined by instrumental neutron activation analysis, Specimens were irradiated by reactor neutrons and subsequently subject to direct analysis using a high-resolution HPGe gamma-spectrometer. Univariate analysis revealed that gastric cancer tissues had significantly higher concentrations of Fe, K, Mg, Na, Rb, Se, and Zn than normal gastric mucosal tissues. However, multivariate analysis found that Fe, K, and Se were independent elements that associated with gastric cancer. Upon further evaluation of their clinical significance, we found a high tissue K level was related to lymphatic duct metastasis. High Se tissue levels were linked to intestinal type adenocarcinoma. A positive correlation was found between high Fe levels and vascular involvement, These findings suggest thatFe and K are associated with gastric cancer progression. Se is involved in carcinogenesis of stomach in high-risk areas. The mechanisms that underlie the corresponding pathohistological features deserve further study.

Keywords: Gastrointestinal Cancer, Oxygen Radicals, Serum Selenium, Trace-Elements, Risk, Metals, Disease, Copper, Blood, Zinc, Gastric Cancer, Potassium, Selenium, Iron

? Pouderoux, P., Friedman, N., Shirazi, P., Ringelstein, J.G. and Keshavarzian, A. (1997), Effect of carbonated water on gastric emptying and intragastric meal distribution. *Digestive Diseases and Sciences*, **42** (1), 34-39.

Full Text: [1997\Dig Dis Sci42, 34.pdf](1997/Dig%20Dis%20Sci42,%2034.pdf)

Abstract: Carbonated water has long been advocated to relieve dyspeptic symptoms, suggesting that it may alter gastric motility via gastric distension. This study aimed to determine the effect of carbonated water on gastric emptying of a radiolabeled mixed meal in eight healthy volunteers. Meal emptying and its distribution within the stomach were assessed with carbonated and still water in a crossover study. Emptying of both solid and liquid, including the duration of the lag phase, was identical for both drinks. However, the proximal stomach contained a greater proportion of solids (74±7% vs 56±8%, P < 0.05) and liquids (43±5% vs 27±4%, P < 0.05) with carbonated water as opposed to still water. Retention of the meal within the proximal stomach ended with the lag phase and was likely related to proximal distension. In conclusion, carbonated water did not alter overall gastric emptying but profoundly modified intragastric distribution of the meal.

Keywords: Gastric Emptying, Gas, Carbonated Water, Gastric Distension, Pressure, Humans

? Heizer, W.D., Sandler, R.S., Seal, E., Murray, S.C., Busby, M.G., Schliebe, B.G. and Pusek, S.N. (1997), Intestinal effects of sulfate in drinking water on normal human subjects. *Digestive Diseases and Sciences*, **42** (5), 1055-1061.

Full Text: [1997\Dig Dis Sci42, 1055.pdf](1997/Dig%20Dis%20Sci42,%201055.pdf)

Abstract: Uncontrolled observations implicate sulfate in drinking water at concentrations exceeding 500-700 mg/liter as a cause of diarrhea, but controlled studies have not been reported. We conducted a controlled study in normal adults to determine the effect of various drinking water sodium sulfate concentrations on bowel function. Ten healthy subjects were given a constant diet and fluid intake. Fluid consisted of 36 ml/kg/day of drinking water of various known sulfate concentrations and 500 ml of other fluid. In a dose-ranging study, four subjects received drinking water with sulfate concentrations of 0, 400, 600, 800, 1000, and 1200 mg/liters for six consecutive two-day periods. In a single-dose study, six other subjects received water with sulfate concentrations of 0 and 1200 mg/liter for two consecutive six-day periods. Stool mass, frequency, and consistency and mouth-to-anus appearance time of colored markers were measured. In the dose-ranging study, the only significant linear trend was decreasing mouth-to-anus appearance time with increasing sulfate concentrations. In the single-dose study, 1200 mg/liter sulfate caused a significant but clinically mild increase in mean stool mass per six-day pool from 621 g to 922 g (P = 0.03). When all 10 subjects were used to compare effects of 0 mg/liter and 1200 mg/liter sulfate, significant differences in stool consistency (P = 0.02) and transit time (P = 0.03) were observed. None of the subjects reported diarrhea or passed more than three stools per day. In 10 normal adult subjects, sulfate in drinking water at a concentration of 1200 mg/liter, which is higher than reported to occur in US municipal water sources, caused a measurable but clinically insignificant increase in stool mass and decrease in stool consistency and appearance time, but no change in stool frequency and no complaint of diarrhea.

Keywords: Diarrhea, Sulfate, Drinking Water, Normal Adults, Inorganic Sulfate, Performance, Excretion, Diarrhea, Acid

? Elahi, B., Nikfar, S., Derakhshani, S., Vafaie, M. and Abdollahi, M. (2008), On the benefit of probiotics in the management of pouchitis in patients underwent ileal pouch anal anastomosis: A meta-analysis of controlled clinical trials. *Digestive Diseases and Sciences*, **53** (5), 1278-1284.

Full Text: 2008\Dig Dis Sci53, 1278.pdf

Abstract: The objective of this study was to evaluate and collect current evidence on the effect of probiotics in preventing pouchitis after restorative ileal pouch anal anastomosis (IPAA). The PUBMED, MEDLINE, EMBASE, CINAHL, Web of Science, and Scopus bibliographic, and Google Scholar databases were searched between 1966 and May 2007, and relevant controlled clinical trials were extracted, reviewed, and validated according to the study protocol. The outcome of interest was for pouchitis defined by a pouchitis disease activity index (PDAI) 7. Five randomized, placebo-controlled clinical trials were included in the meta-analysis. Pooling of the results from these trials yielded an odds ratio (OR) of 0.04 with a 95% CI of 0.01-0.14 (P < 0.0001) in the treatment group in comparison with the placebo group. In conclusion, the benefit of probiotics in the management of pouchitis after IPAA operation was confirmed by the meta-analysis.

Keywords: 4 Weeks Intervention, Antibiotic-Therapy, Bibliographic, Clinical Trials, Controlled Clinical Trials, Crohns-Disease, Databases, Disease, Double-Blind, Google Scholar, Ileal Pouch Anal Anastomosis, Inflammatory-Bowel-Disease, Interest, Lactobacillus-Rhamnosus GG, Maintenance, Management, Meta-Analysis, Outcome, Placebo-Controlled Trial, Pouchitis, Probiotics, Protocol, Ratio, Science, Scopus, Surgery, Treatment, Ulcerative-Colitis, Web of Science

? Wang, L., Li, Y.M. and Li, L. (2009), Meta-analysis of randomized and controlled treatment trials for achalasia. *Digestive Diseases and Sciences*, **54** (11), 2303-2311.

Full Text: [2009\Dig Dis Sci54, 2303.pdf](2009/Dig%20Dis%20Sci54,%202303.pdf)

Abstract: Pharmacological therapy, botulinum toxin injection, pneumatic dilatation, and surgical myotomy are the primary therapeutic modalities for achalasia, for which laparoscopic myotomy is recommended as state-of-the-art therapy. However, its efficacy and safety remain unclear compared with other approaches in the treatment of achalasia. We searched electronic databases (MEDLINE, EMBASE, Cochrane Central Registry of Controlled Trials, LILACS-Latin American, Caribbean health science literature, and Science Citation Index Expanded) for randomized controlled trials to evaluate which therapeutic measures are temporary and reversible and which measures are definitive and effective by pooling data including remission rate, relapse rate, complications, and adverse effects. Seventeen studies with 761 patients met our inclusion criteria. There was better remission rate in pneumatic dilation than in botulinum toxin injection for initial intervention [relative risk (RR) 2.20, 95% confidence interval (CI) 1.51-3.20], Pneumatic dilation had lower relapse rate than did botulinum toxin injection (RR 0.12, 95% CI 0.04-0.32). Compared with pneumatic dilation, laparoscopic myotomy further increased remission rate (RR 1.48, 95% CI 1.48-1.87), and reduced clinical relapse rate (RR 0.14, 95% CI 0.04-0.58), and there was no difference in complication rate (RR 1.48, 95% CI 0.37-5.99). Based on limited randomized and controlled trials, laparoscopic myotomy is the preferred method for patients with achalasia. Future trials should investigate whether laparoscopic myotomy combined with different modalities of fundoplication is superior to isolated laparoscopic myotomy.

Keywords: Achalasia, Antireflux Procedure, Balloon Dilation, Botulinum Toxin Injection, Citation, Comparing Pneumatic Dilatation, Criteria, Databases, DOR Fundoplication, Esophageal Achalasia, Follow-up, Forceful Dilatation, Health, Idiopathic Achalasia, Intervention, Intrasphincteric Botulinum-Toxin, Laparoscopic Heller Myotomy, Laparoscopic Myotomy, Literature, Medline, Meta-Analysis, Pneumatic Dilation, Primary, Randomized Controlled Trials, Risk, Science, Science Citation Index, Therapy, Treatment

? Shao, L.M., Chen, Q.Y., Chen, M.Y. and Cai, J.T. (2010), Nitroglycerin in the prevention of post-ERCP pancreatitis: A meta-analysis. *Digestive Diseases and Sciences*, **55** (1), 1-7.

Full Text: [2010\Dig Dis Sci55, 1.pdf](2010/Dig%20Dis%20Sci55,%201.pdf)

Abstract: The objective of this research paper is to evaluate the effect of prophylactic nitroglycerin in the prevention of post-endoscopic retrograde cholangiopancreatography (ERCP) pancreatitis (PEP) by performing a meta-analysis of randomized controlled trials (RCTs). Electronic databases, including PubMed, EMBASE, the Cochrane library, and the Science Citation Index, were searched to retrieve relevant trials. Outcome measures were the incidence of PEP. Four RCTs, enrolling a total of 856 patients, were included. Meta-analysis of these trials indicated a significant association between the use of nitroglycerin and the reduction of PEP (RR 0.60; 95% CI: 0.39-0.92; P = 0.02). However, subsequent sensitive analysis failed to confirm that nitroglycerin was statistically superior to a placebo in reducing PEP (RR 0.68; 95% CI: 0.41-1.11; P = 0.12). Based on the limitations in this meta-analysis, prophylactic use of nitroglycerine for all patients who underwent ERCP is not recommended. Further clinical trials are required to confirm the effect of nitroglycerin in the prevention of PEP.

Keywords: Citation, Clinical Pharmacokinetics, Complications, Double-Blind, Endoscopic Retrograde Cholangiopancreatography, Meta-Analysis, Nitroglycerin, Placebo-Controlled Trial, Post-ERCP Pancreatitis, Prospective Multicenter, Research, Risk-Factors, Science Citation Index, Sphincter, Therapeutic ERCP, Transdermal Glyceryl Trinitrate

? Slavenburg, S., Heijdra, Y.F. and Drenth, J.P.H. (2010), Pneumonitis as a consequence of (Peg)interferon-ribavirin combination therapy for hepatitis C: A review of the literature. *Digestive Diseases and Sciences*, **55** (3), 579-585.

Full Text: 2010\Dig Dis Sci55, 579.pdf

Abstract: Combination of peginterferon and ribavirin is the current therapy for chronic hepatitis C infection (HCV). Interstitial pneumonitis is a rare side-effect of HCV therapy and is an important cause of dose reduction or discontinuation, impairing success of antiviral therapy. We performed a review of the literature in order to present diagnostic modalities and possible treatments for pneumonitis and to offer guidelines. We searched for cases where pneumonitis as a side-effect of HCV treatment was documented. First we performed a literature search via PUBMED and Web of Science interface and second we searched three drug toxicity databases. We systematically analyzed all case reports with respect to clinical manifestations, type of treatment, and outcome. A literature search revealed 19 articles, containing 25 case descriptions, while we traced 33 cases from the drug toxicity databases. Pneumonitis presented with any of the combination of fever, dyspnea, and cough and can arise with any type of (conventional or pegylated) interferon. Mortality secondary to pneumonitis was seen in 7% of cases, exclusively with peginterferon alpha-2b. In most cases therapy was discontinued and steroids were started. Interferon-induced pneumonitis during HCV treatment is a severe complication and should be recognized in order to prevent further pulmonary damage and/or death.

Keywords: (Peg)Interferon, Alfa, Alpha-Interferon, Case Reports, Databases, Drug, Fever, Guidelines, Hcv, Hepatitis, Hepatitis C, Induced Interstitial Pneumonitis, Infection, Literature, Management, Mortality, Outcome, Patient, Pegylated Interferon-Alpha-2B, Pneumonitis, Pubmed, Review, Ribavirin, Ribavirin, Science, Success, Therapy, Toxicity, Treatment, Web of Science

# Title: Digital 98 Libraries. Third ACM Conference on Digital Libraries

Full Journal Title: Digital 98 Libraries. Third ACM Conference on Digital Libraries

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Giles, C., Bollacker, K. and Lawrence, S. (1998), CiteSeer: An automatic citation indexing system. *Digital 98 Libraries. Third ACM Conference on Digital Libraries*, 89-98.

Abstract: We present CiteSeer: an autonomous citation indexing system which indexes academic literature in electronic format (e.g. postscript files on the Web). CiteSeer understands how to parse citations, identify citations to the same paper in different formats, and identify the context of citations in the body of articles. CiteSeer provides most of the advantages of traditional (manually constructed) citation indexes (e.g. the ISI citation indexes), including: literature retrieval by following citation links (e.g. by providing a list of papers that cite a given paper), the evaluation and ranking of papers, authors, journals, etc., based on the number of citations, and the identification of research trends. CiteSeer has many advantages over traditional citation indexes, including the ability to create more up-to-date databases which are not limited to a preselected set of journals or restricted by journal publication delays, completely autonomous operation with a corresponding reduction in cost, and powerful interactive browsing of the literature using the context of citations. Given a particular paper of interest, CiteSeer can display the context of how the paper is cited in subsequent publications. This context may contain a brief summary of the paper, another author’s response to the paper, or subsequent work which builds upon the original article. CiteSeer allows the location of papers by keyword search or by citation links. Papers related to a given paper can be located using common citation information or word vector similarity. CiteSeer will soon be available for public use.

Keywords: Autonomous, Citation, Citation Indexes, Citations, Constructed, Context, Cost, Databases, Evaluation, Identification, Indexing, Information, ISI, Journal, Journals, Literature, Location, Operation, Papers, Public, Publication, Publications, Ranking, Reduction, Research, Similarity, Trends, Work

# Title: Digital Libraries: Universal and Ubiquitous Access to Information, Proceedings

Full Journal Title: Digital Libraries: Universal and Ubiquitous Access to Information, Proceedings

ISO Abbreviated Title:

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ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

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Subject Categories:

: Impact Factor

? Krapivin, M. and Marchese, M. (2008), Focused page rank in scientific papers ranking. *Digital Libraries: Universal and Ubiquitous Access to Information, Proceedings*, **5362**, 144-153.

Abstract: We propose Focused Page Rank (FPR) algorithm adaptation for the problem of scientific papers ranking. FPR is based on the Focused Surfer model, where the probability to follow the reference in a paper is proportional to its citation count. Evaluation on Citeseer autonomous digital library content showed that proposed model is a tradeoff between traditional citation count and basic Page Rank (PR). In contrast to basic Page Rank, proposed Focused Surfer model suffers less from the “outbound links” problem. We believe that FPR algorithm is closer to reality because highly cited papers are more visible and tend to attract more citations in future. This is in accordance with the one of the most significant principles of Scientometrics. No need for lexical analysis of the domain corpus and simplicity of implementation are among the strong points of the proposed model and make the proposed ranking technique attractive for academia digital libraries.

Keywords: Academia, Adaptation, Algorithm, Analysis, Autonomous, Citation, Citation Count, Citation-Based Metrics, Citations, Content, Contrast, Digital Libraries, Evaluation, Focused Surfer, Implementation, Model, Page Rank, Papers, Principles, Problem, Ranking, Reality, Reference, Scientometrics, Technique

? Blooma, M.J., Chua, A.Y.K. and Goh, D.H.L. (2008), Mapping the question answering domain. *Digital Libraries: Universal and Ubiquitous Access to Information, Proceedings*, **5362**, 396-397.

Abstract: We present a trend analysis of the question answering (QA) domain. Bibliometric mapping was used to sketch the boundary of the domain by uncovering the topics central to and peripheral to QA research in the new Millennium. This paper visualizes the evolution of concepts in the QA domain by studying the dynamics of the QA research during the periods 2000 - 2003 and 2004 - 2007. It was found that question classification, answer extraction, information retrieval, user interface, performance evaluation, web, & natural language were the main topics in current QA research.

Keywords: Analysis, Bibliometric, Bibliometric Mapping, Classification, Co-Word Analysis, Dynamics, Evaluation, Evolution, Extraction, Information, Information Retrieval, Interface, Language, Mapping, Natural, Performance, Performance Evaluation, Question Answering, Research, Trend, Trend Analysis, User Interface, Web

# Title: Disability and Rehabilitation

Full Journal Title: [Disability and Rehabilitation](http://www.informaworld.com/smpp/title~db=all~content=t713723807~tab=issueslist)

ISO Abbreviated Title:

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ISSN: 0963-8288

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? McNally, S., Ben-Shlomo, Y. and Newman, S. (1999), The effects of respite care on informal carers’ well-being: A systematic review. *Disability and Rehabilitation*, **21** (1), 1-14.

Full Text: [1999\Dis Reh21, 1.pdf](1999/Dis%20Reh21,%201.pdf)

Abstract: Purpose: The provision of respite care is a common method employed to reduce the burden on those who care for individuals with a chronic illness or disability. The aim of the present review was to examine research on respite provision with a view to establishing what effect it has on carers. Method: A literature search was conducted for studies examining the effect of respite provision on carers, ‘Psyclit’, ‘Medline’ and Social Science Citation Index computerized databases were utilized, followed by a search of the reference sections of relevant studies. Results: The search yielded 29 studies, from which there was little evidence that respite intervention has either a consistent or enduring beneficial effect on carers’ well-being. This may be due in part to the fact that the majority of the work conducted has been methodologically poor. Also significant, however, might be that the findings suggest respite care often fails to facilitate the maintenance of socially supportive relationships, which may moderate strain after respite has ended. Conclusions: A more ‘carer-centred’ approach is required in both the provision and evaluation of respite care intervention. This approach would address the experiences of both caregiver and carl-recipient during the respite period.

Keywords: Alzheimers Patients, Burden, Caregivers, Children, Chronic, Citation, Databases, Dementia, Evaluation, Families, Intervention, Literature, Medline, Randomized Trial, Research, Review, Science, Science Citation Index, Service, Social Science Citation Index, Strain, Stress, Support, Systematic Review

? Punt, T.D. and Riddoch, M.J. (2006), Motor neglect: Implications for movement and rehabilitation following stroke. *Disability and Rehabilitation*, **28** (13-14), 857-864.

Full Text: 2006\Dis Reh28, 857.pdf

Abstract: Purpose. The syndrome of unilateral neglect following stroke is associated with poor outcome and presents significant challenges to those providing therapy for affected individuals. In contrast to a number of reviews which have recently appeared in therapy and rehabilitation journals relating to sensory aspects of neglect, this review focuses on ‘motor neglect’. Search strategy. We searched the clinical and scientific literature for papers concerning motor neglect. The search included the databases Web of Science, PUBMED and Cinahl, primarily using the term ‘motor neglect’. There was also a large degree of secondary searching involved. Discussion. Motor neglect refers to the under-utilization of a limb opposite a brain lesion that cannot be fully explained by primary sensory and motor deficits. The paper discusses classical descriptions of motor neglect and highlights the difficulties in disentangling motor neglect from hemiparesis. The related problem of motor extinction is introduced as a useful clinical measure of neglect-related movement difficulties and a significant clinical problem in its own right. Conclusion. Motor neglect is a relatively under-recognized deficit which may have a significant impact on patient performance and recovery following stroke. We conclude with a discussion of the implications of motor neglect for rehabilitation, including the relative contributions that may be made by Constraint-induced movement therapy and Bilateral movement therapy in managing patients with neglect-related movement problems.

Keywords: Attention, Behavior, Brain, Databases, Extinction, Hemiparetic Stroke, Hemiplegia, Hemispatial Neglect, Hemisphere Damage, Impact, Journals, Limb Activation, Literature, Movement, Neglect, Non-Sensory Neglect, Outcome, Papers, Primary, Recovery, Rehabilitation, Review, Science, Search Strategy, Strategy, Stroke, Therapy, Unilateral Spatial Neglect, Web of Science

? Lidal, I.B., Huynh, T.K. and Biering-Sorensen, F. (2007), Return to work following spinal cord injury: A review. *Disability and Rehabilitation*, **29** (17), 1341-1375.

Full Text: 2007\Dis Reh29, 1341.pdf

Abstract: Purpose. To review literature on return to work (RTW) and employment in persons with spinal cord injury (SCI), and present employment rates, factors influencing employment, and interventions aimed at helping people with SCI to obtain and sustain productive work. Methods. A systematic review for 2000-2006 was carried out in PUBMED/MEDLINE, AMED, (ISI) Web of Science, EMBASE, CINAHL, PsycInfo and Sociological abstracts database. The keywords ‘spinal cord injuries’, ‘spinal cord disorder’, ‘spinal cord lesion’ or ‘spinal cord disease’ were cross-indexed with ‘employment’, ‘return to work’, ‘occupation’ or ‘vocational’. Results. Out of approximately 270 hits, 110 references were used, plus 13 more found elsewhere. Among individuals with SCI working at the time of injury 21 - 67 % returned to work after injury. RTW was higher in persons injured at a younger age, had less severe injuries and higher functional independence. Employment rate improved with time after SCI. Persons with SCI employed ranged from 11.5% to 74%. Individuals who sustained SCI during childhood or adolescence had higher adult employment rates. Most common reported barriers to employment were problems with transportation, health and physical limitations, lack of work experience, education or training, physical or architectural barriers, discrimination by employers, and loss of benefits. Individuals with SCI discontinue working at younger age. Conclusions. This review confirmed low employment rates after SCI. Future research should explore interventions aimed at helping people with SCI to obtain and sustain productive work.

Keywords: Adult, Assistive Technology, Barriers, Community Integration, Discrimination, Disease, Disorder, Education, Embase, Employment, Employment Outcomes, Functional, Individuals, Injury, Interventions, ISI, Literature, Long-Duration, Methods, Occupation, Participation, People, Quality-of-Life, Research, Return To Work, Review, Review Literature, Risk-Factors, Satisfaction, Sci, Science, Spinal Cord Disorder, Spinal Cord Injuries, Spinal Cord Lesion, Systematic, Systematic Review, Training, Vocational, Web of Science

? Negrini, S. (2008), Approach to scoliosis changed due to causes other than evidence: Patients call for conservative (rehabilitation) experts to join in team orthopedic surgeons. *Disability and Rehabilitation*, **30** (10), 731-741.

Full Text: [2008\Dis Reh30, 731.pdf](2008/Dis%20Reh30,%20731.pdf)

Abstract: Purpose. To look critically at the present reality of AIS (Adolescent Idiopathic Scoliosis) treatment and verify the hypothesis that the current prevalence of a single medical specialty could be creating distortions in patient care and/or cure. Method. This is a multifaceted study comprising a review of the evidence on AIS, a bibliometric study of the general and orthopedic literature since MEDLINE start, and two case reports. Results. Evidence exists to support the efficacy of exercises, bracing and fusion (grade B, B and C recommendations, respectively), but in clinics exercises are generally ignored; braces are used with some criticism, while fusion is generally considered the only reliable treatment. The literature on AIS treatment prevails in journals of orthopedic surgery, and therapy papers focused on surgery have increased from 34 to 55% over the past two decades. The two clinical cases show how an incorrect psychological approach to the patient and family, as well as inappropriate conservative treatments can have disastrous consequences for patients. Conclusions. Our results seem to confirm the initial hypothesis: The interest of the AIS treatment community (composed almost exclusively by orthopedic surgeons) has shifted toward fusion whereas research has increased, while conservative treatment is suffering a decrease in professional interest (and diminished research). AIS requires expert, committed evidence-based care, but other specialists totally devoted to conservative treatment, particularly (but not exclusively) Physical and Rehabilitation Medicine specialists, should enter the field to create better treating teams.

Keywords: Approach, Bibliometric, Bibliometric Study, Bracing, Care, Case Reports, Clinical, Community, Conservative Treatment, Efficacy, Evidence, Evidence Based, Evidence-Based, Exercises, Experts, Family, Field, Fusion, General, Journals, Literature, Medical, Medical Specialty, Papers, Patient Care, Patients, Prevalence, Recommendations, Rehabilitation, Research, Review, Scoliosis, Specialty, Suffering, Support, Surgery, Therapy, Treatment

? Hawes, M.C. and O’Brien, J.P. (2008), A century of spine surgery: What can patients expect? *Disability and Rehabilitation*, **30** (10), 808-817.

Full Text: Dis Reh30, 808.pdf

Abstract: Purpose. To evaluate the hypothesis that spinal fusion surgery is an effective method to address spinal deformity-associated clinical problems, including magnitude of curvature (Cobb angle), pulmonary dysfunction, and pain. Method. A systematic review was carried out using Science Citation Index (SCI) Expanded (1900-present), Social Sciences Citation Index (1956-present), Arts and Humanities Citation Index (1965-present), MEDLINE (1950-present) and PubMed Central databases (1887-present) to access information regarding efficacy of spine surgery in preventing or improving the health and function of patients diagnosed with scoliosis in adolescence. Results. Since 1950, more than 12,600 articles on scoliosis have been published, and nearly 50% (5721) focus on methods, rationale, outcome, and complications of surgical intervention. Among these, 82 articles have documented outcome for groups of >= 10 patients, treated for adolescent idiopathic scoliosis, and followed for at least 2 years after treatment. These data provide an overview of the impact of spine surgery on scoliosis for 5780 patients as surgery methods and approaches have evolved. Conclusions. For most patients, a reduced magnitude of spinal curvature can be achieved through one or more spinal fusion surgeries. There is no evidence to support the premise that this result is correlated with improved pulmonary function or reduced pain.

Keywords: Access, Adolescence, Adolescent, Adolescent Idiopathic Scoliosis, Arts and Humanities Citation Index, Clinical, Complications, Data, Databases, Efficacy, Evidence, Function, Fusion, Health, Impact, Information, Intervention, Methods, Outcome, Pain, Patients, Pubmed, Pulmonary Function, Review, SCI, Science Citation Index, Scoliosis, Spinal, Spinal Fusion, Spine, Support, Surgery, Systematic Review, Treatment

? Fadyl, J.K., McPherson, K.M., Schluter, P.J. and Turner-Stokes, L. (2010), Factors contributing to work-ability for injured workers: Literature review and comparison with available measures. *Disability and Rehabilitation*, **32** (14), 1173-1183.

Full Text: 2010\Dis Reh32, 1173.pdf

Abstract: Purpose. Despite a range of factors being proposed in research literature to be key to ‘work-ability’, agreed definitions and boundaries of this concept are lacking. This review sought to identify and clarify key factors thought to contribute to individual work-ability, then compare these against existing measures of work-ability for people with injury. Method. A literature search was undertaken based on principles of systematic review. MEDLINE, AMED, Scopus and Web of Science databases were searched. All potentially relevant articles were obtained and, if they met inclusion criteria, evaluated for quality. The search was expanded and repeated to identify currently available measures of work-ability for people with injury. These measures were then compared against components from the first search. Results. Thirty-four articles were obtained from the first search, and 23 provided information about factors that contribute to work-ability. Six broad categories were identified: physical, psychological, cognitive, social/behavioural, workplace factors, and factors outside the workplace. The follow-up search identified 10 measures. No one measure captured all six identified categories. Conclusions. Components contributing to work-ability go beyond the ability to perform particular work tasks. Measures intended to be used to inform vocational rehabilitation arguably need to consider all these factors to maximise likelihood of a sustainable return to work.

Keywords: Back-Pain, Databases, Definitions, Disability, Follow-up, Functional-Capacity Evaluations, Health, Information, Injury, Instability Scale, Literature, Literature Review, Medline, Office Workers, Outcome Measures, Questionnaire, Rehabilitation, Research, Return, Return to Work, Review, Science, Scopus, Systematic, Systematic Review, Traumatic Brain-Injury, Vocational, Vocational Rehabilitation, Web of Science, Work Ability, Work Disability, Work Functioning

? Hayward, K., Barker, R. and Brauer, S. (2010), Interventions to promote upper limb recovery in stroke survivors with severe paresis: A systematic review. *Disability and Rehabilitation*, **32** (24), 1973-1986.

Full Text: 2010\Dis Reh32, 1973.pdf

Abstract: Purpose. To investigate the effect of interventions that promote upper limb (UL) recovery in stroke survivors with severe paresis. Methods. A systematic search of the scientific literature from January 1970 to March 2009 was conducted using CINAHL, Cochrane, PEDro, PUBMED and Web of Science. keywords used included stroke, severe, hemiplegia, UL, task-oriented, robot, non-robot and electrical stimulation. Methodological quality of the studies was assessed using the PEDro rating scale. Studies were grouped into one of three intervention categories: robotic therapy, electrical stimulation or ‘other’ therapy. Results. Seventeen randomised controlled trials met the inclusion criteria. A ‘best evidence synthesis’ indicated strong evidence that robotic therapy provides a large beneficial effect and limited evidence that electrical stimulation and ‘other’ interventions provide a large beneficial effect on function. There is no evidence that these interventions influence use of the arm in everyday tasks. Conclusion. There are a number of newly developed interventions that enable stroke survivors with severe paresis to actively participate in task-oriented practice to promote UL recovery. While these interventions offer some promise for stroke survivors with severe paresis, ultimately, the effectiveness of these interventions will be dependent on whether they lead to restoration of function to the point at which the stroke survivor can practice everyday tasks.

Keywords: 2 Centers, Affected Arm, Cochrane, Effectiveness, Electrical Stimulation, Feedback, Intervention, Interventions, Lead, Literature, Methods, Motor Recovery, Neuromuscular Stimulation, Practice, Randomized Clinical-Trial, Rehabilitation, Restoration, Review, Robot-Assisted Therapy, Robotic Therapy, Science, Single-Blind, Stroke, Systematic, Systematic Review, Therapy, Upper Limb, Upper-Extremity, Web Of Science

? Jones, F. and Riazi, A. (2011), Self-efficacy and self-management after stroke: A systematic review. *Disability and Rehabilitation*, **33** (10), 797-810.

Full Text: 2011\Dis Reh33, 797.pdf

Abstract: Purpose. aEuro integral The purpose of this review is to examine (1) the influence of self-efficacy on rehabilitation outcomes post-stroke, and (2) the evidence to support self-management interventions based on self-efficacy principals for stroke survivors. Method. aEuro integral MEDLINE, EMBASE, Psychlit, Web of Science, AMED and Cochrane Databases for systematic reviews databases were searched for relevant articles in English between 2000 and ending in July 2009. Articles included (1) primary research testing relationships between self-efficacy and rehabilitation outcomes including the measuring impairment and activity or participation in a stroke population, and (2) research testing efficacy and effectiveness of self-management interventions designed specifically for a stoke population in which the principle theoretical framework is self-efficacy or a similar control cognition. Methodological quality appraisal and data extraction was carried out by two reviewers. Results. aEuro integral of the 104 articles that were identified by the search, 22 met the criteria to be included in the review. There is evidence that self-efficacy is an important variable associated with various outcomes post-stroke. These outcomes include quality of life or perceived health status, depression, ADL and, to a certain extent, physical functioning. Further empirical evidence is needed to extend these findings, and to determine whether self-efficacy has additional predictive value over and beyond the objective measures of impairment. There is also emerging evidence of benefits to be gained from programmes that target self-management based on self-efficacy principles; however, the optimal format of delivering these interventions for stroke survivors is not clear. Conclusions. aEuro integral There is a need for researchers, to work together with other stakeholders to develop and test interventions that can support self-management skills and confidence to make continued progress after stroke. This could help to reduce some of the negative consequences of stroke such as reduced quality of life and social isolation.

Keywords: Articles, Balance, Care, Cochrane, Cognition, Control, Controlled-Trial, Databases, Depression, Disability Following Stroke, Effectiveness, Efficacy, Falls Efficacy, Health Status, History, Intervention, Interventions, Outcomes, Perceived Control, Primary, Quality of Life, Recovery, Rehabilitation, Research, Researchers, Review, Science, Self-Efficacy, Self-Management, Social, Social Isolation, Stroke, Systematic, Systematic Review, Systematic Reviews, Web of Science

# Title: Disasters

Full Journal Title: Disasters

ISO Abbreviated Title: Disasters

JCR Abbreviated Title: Disasters

ISSN: 0361-3666

Issues/Year: 4

Journal Country/Territory: England

Language: English

Publisher: Blackwell Publ Ltd

Publisher Address: 108 Cowley Rd, Oxford OX4 1JF, Oxon, England

Subject Categories:

Planning & Development: Impact Factor 0.435, / (2000)

Rossi, P.H. and Wright, J.D. (1983), Community response to earthquake threat in Southern California by Ralph H. Turner, Joanne M. Nigg, Denise Heller Paz and Barbara Shaw Young. *Disasters*, **7** (2), 151-153.

Alexander, D. (1989), The politics and economics of earthquake hazard mitigation: Unreinforced masonry buildings in Southern California, by Daniel J. Alesch, and William J. Petak. *Disasters*, **13** (3), 283-285.

Bolin, R. and Stanford, L. (1998), The Northridge earthquake: Community-based approaches to unmet recovery needs. *Disasters*, **22** (1), 21-38.

Abstract: The 1994 Northridge, California earthquake has proven to be one of the most costly disasters in United States history. Federal and state assistance programmes received some 681,000 applications from victims for various forms of relief In spite of the flow of US$11 billion in federal assistance into Los Angeles and Ventura counties, many victims have failed to obtain adequate relief These unmet needs relate to the vulnerability of particular class and ethnic groups. In response to unmet needs, a number of non-governmental organisations (NGOs) have become involved in the recovery process. This paper, based on evidence collected from hundreds of in-depth interviews with the people involved, examines the activities of several community-based organisations (CBOs) and other NGOs as they have attempted to assist vulnerable people with unmet post-disaster needs. We discuss two small ethnicallydiverse communities in Ventura County, on the periphery of the Los Angeles metropolitan region. The earthquake and resultant disaster declaration provided an opportunity for local government and NGOs to acquire federal resources not normally available for economic development. At the same time the earthquake created political openings in which longer-term issues of community development could be addressed by various local stakeholders, A key issue in recovery has been the availability of affordable housing for those on low incomes, particularly Latinos, the elderly and farm workers. We discuss the successes and limitations of CBOs and NGOs as mechanisms for dealing with vulnerable populations, unmet needs and recovery issues in the two communities.

# Title: Discovery

Full Journal Title: Discovery

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Price, D.S. (1956), The exponential curve of science. *Discovery*, **17** (6), 240-243.

Full Text: 1956\ Discovery17, 240.pdf

# Title: Discussions of the Faraday Society

(Discuss. Faraday Soc., Discn. Faraday Soc., Discuss. Faraday Soc.)

Discussions of the Faraday Society was published from 1947-1971. In 1972 it continued as [Faraday Discussions of the Chemical Society](http://xlink.rsc.org/jumptojournal.cfm?journal_code=CD)

Full Journal Title: [[Discussions of the Faraday Society](http://xlink.rsc.org/jumptojournal.cfm?journal_code=DF)](http://www.rsc.org/is/journals/current/faraday/fdcon.htm)

ISO Abbreviated Title:

JCR Abbreviated Title: Discuss Faraday Soc

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Kressman, T.R.E. and Kitchener, J.A. (1949), Cation exchange with a synthetic phenolsulphonate resin. Part V. Kinetics. *Discussions of the Faraday Society*, **7**, 90-104.

Full Text: [D\Dis Far Soc7, 90.pdf](D/Dis%20Far%20Soc7,%2090.pdf)

? Conway, B.E., Rudd, E.J. and Gordon, L.G.M. (1968), Reaction order and adsorption in the kinetics of organic electrode reactions. Applications to reduction of acetophenone. *Discussions of the Faraday Society*, **45**, 87-105.

Full Text: Dis Far Soc45, 87.pdf

Abstract: In the study of organic electrode reactions, it is desirable to complement kinetic and polarographic information by direct adsorption studies in relation to data on reaction orders and Tafel slopes. In the present paper, the kinetics of reduction of acetophenone are considered in relation to (*a*) adsorption and orientation of reactant (and product) molecules, and (*b*) surface pressure behaviour as a function of potential and coverage. Adsorption studies have been made by a new electrocapillary procedure and the surface excess quantities and surface pressures have been obtained. Kinetic reaction orders *R* have been derived from potentiostatic current-voltage curves and examined in relation to the isotherms for reactant adsorption. Theoretical cases are considered for evaluation of *R* as a function of coverage and concentration for various types of isotherms. The observed experimental behaviour can be treated in terms of interaction effects (Frumkin/Temkin types of isotherm) arising from dipole repulsions. Primary H/D isotope effects have been examined in the kinetics in order to evaluate the role of proton transfer in the reduction mechanism. The importance of concurrent studies of reactant and product adsorption with evaluation of the kinetics of organic electrode reactions is stressed.

Levine, S. and Smith, A.L. (1971), Theory of the differential capacity of the oxide/aqueous electrolyte interface. *Discussions of the Faraday Society*, **52**, 290-301.

Full Text: Dis Far Soc52, 290.pdf

Abstract: The conditions under which an oxide surface in aqueous solution will obey the Nernst equation with respect to H+/OH– as potential-determining ions are investigated and a modified form of the Nernst equation is derived. This is combined with a model of the inner part of the double layer involving adsorption of both anions and cations of a supporting uni-univalent electrolyte and a discreteness-of-charge correction in their adsorption isotherms. Theoretical total differential capacities at the interface are compared with experimental data for TiO2 and SiO2.

# Title: Diseases of the Chest

Full Journal Title: Diseases of the Chest

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Siegel, M.B. (1962), Chelation therapy - Application and usefulness in iatrogenic cardiac arrhythmias. *Diseases of the Chest*, **41** (2), 225-228.

# Title: Diseases of the Esophagus

Full Journal Title: Diseases of the Esophagus

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Sun, L. and Yu, S.Y. (2011), Meta-analysis: Non-steroidal anti-inflammatory drug use and the risk of esophageal squamous cell carcinoma. *Diseases of the Esophagus*, **24** (8), 544-549.

Full Text: [2011\Dis Eso24, 544.pdf](2011/Dis%20Eso24,%20544.pdf)

Abstract: The relationship between non-steroidal anti-inflammatory drug (NSAID) use and esophageal squamous cell carcinoma (ESCC) has remained unclear. To evaluate the relationship between NSAID use and risk of ESCC, we searched the MEDLINE, Biosis, Web of Science and ISI proceedings databases up to September 2010, together with a manual search of reference lists of relevant articles. Studies evaluating the association between exposure to NSAIDs and risk of ESCC were included. The analyses used random-effect or fixed-effect model based on homogeneity analysis. Seven studies (six case-control studies and one nested case-control study) were included in this meta-analysis. NSAID use was associated with a reduced risk of ESCC (odds ratio = 0.58, 95% confidence interval = 0.47 to 0.72). Specific analysis for aspirin and non-aspirin NSAIDs yielded similar results. There was a protective association between NSAIDs and ESCC. This finding warrants more prospective studies evaluating the relationship between NSAIDs and ESCC.

Keywords: Analysis, Apoptosis, Aspirin, Aspirin Use, Association, Cancer-Cells, Carcinoma, Case-Control, Case-Control Studies, Case-Control Study, Chemoprevention, Cycle Arrest, Cyclooxygenase-2 Expression, Databases, Drug, Drug Use, ESCC, Exposure, Gastric-Cancer, Inhibitors, ISI, Medline, Meta Analysis, Meta-Analysis, Model, Nested Case-Control, Nsaids, Prospective Studies, Ratio, Rheumatoid-Arthritis, Risk, Science, Sphincter-Relaxing Drugs, Web of Science

# Title: Disposal of Sewage and Other Water-Borne Wastes

Butterworths, London

Imhoff, K., Müller, W.J. and Thistlethwayte, D.K.S. (1971), *Disposal of Sewage and Other Water-Borne Wastes*, Butterworths, London.

# Title: Distance Education

Full Journal Title: Distance Education

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Baggaley, J. (2010), The satirical value of virtual worlds. *Distance Education*, **31** (1), 115-119.

Abstract: Imaginary worlds have been devised by artists and commentators for centuries to focus satirical attention on society’s problems. The increasing sophistication of three-dimensional graphics software is generating comparable ‘virtual worlds’ for educational usage. Can such worlds play a satirical role suggesting developments in distance education practice and policy? The article examines the emergence of Hinterlife, a cartoon world run by a disarmingly despotic academic known to the real world only by his virtual name, Professor Horace. This article suggests that a healthy dose of satire can help distance education to overcome the problems generated in difficult economic times.

Keywords: Burnout, Diploma Mills, Education, Graphic Learning Environments, Mutual Deprivation, Online Learning, Plagiarism, Policy, Recession, Satire, Shared Misery, Virtual Worlds

# Title: Diversity & Distributions

Full Journal Title: [Diversity & Distributions](http://uk.jstor.org/journals/13669516.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1366-9516

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Field, R. (2000), A starting point for biodiversity literature. *Diversity & Distributions*, **6** (6), 325-326.

Full Text: [2000\Div Dis6, 325.pdf](2000/Div%20Dis6,%20325.pdf)

? Richardson, D.M. and Pyšek, P. (2008), Fifty years of invasion ecology - the legacy of Charles Elton. *Diversity & Distributions*, **14** (2), 161-168.

Full Text: [2008\Div Dis14, 161.pdf](2008/Div%20Dis14,%20161.pdf)

Abstract: The publication, in 1958, of Charles Elton’s book The ecology of invasions by animals and plants launched the systematic study of biological invasions. Invasion ecology has grown to become an important multi-disciplinary subfield of ecology with growing links to many other disciplines. This paper examines the citation history of Elton’s book using the Web of Science. We also examine Elton’s influence in shaping the current research agenda in invasion ecology, for which we use the 28 papers in a special issue of Diversity and Distributions (Volume 14: 2) as a representative sample. After 50 years, Elton’s book remains the most cited single source in the field (> 1500 citations), and is cited more often every year (> 100 times) than any other invasion-related publication, including influential papers in journals. Most citations to Elton’s book refer to particular topics/concepts covered in the book, rather than citing it as a general reference about invasions. The shift in the distribution of topics/concepts cited with reference to Elton over time follows the same trend as for biogeography and ecology in general (increasing emphasis on analytical studies, multi-scale analyses, multi-disciplinary studies, etc.). Some topics emphasized by Elton are still the focus of current research (dispersal and spread of invasive organisms, impact on biodiversity, role of disturbance and enemy release) but several prominent themes in modern studies were not addressed by Elton. The emergence of new themes can be attributed to a general change in approach and emphasis underpinning research questions in conservation biogeography and applied ecology over the last half century (risk analysis, multi-scale comparisons, propagule pressure, experimental approaches) and to the recent emergence and increasing availability of large data sets on the distribution of introduced species and to the emergence of key technologies (e.g. geographic information systems, modelling techniques, including niche-based modelling, and molecular methods). Half a century after its publication, Charles Elton’s book on invasions remains influential, but massive changes in the status of invasions and other environmental issues worldwide, together with advances in technology, are reshaping the game rules and priorities of invasion ecology.

Keywords: Advances, Analyses, Analysis, Animals, Approach, Availability, Biodiversity, Biogeography, Biological, Biological Invasions, Changes, Citation, Citations, Conservation, Data, Dispersal, Distribution, Disturbance, Ecology, Environmental, Experimental, Field, General, Geographic Information, Geographic Information Systems, History, Impact, Information, Information Systems, Introduced Species, Invasive, Journals, Methods, Modelling, Multidisciplinary, Papers, Plants, Pressure, Publication, Release, Research, Research Agenda, Risk, Risk Analysis, Role, Source, Species, Systems, Techniques, Technologies, Technology, Trend, Web of Science

? Carrillo-Gavilan, M.A. and Vila, M. (2010), Little evidence of invasion by alien conifers in Europe. *Diversity & Distributions*, **16** (2), 203-213.

Full Text: 2010\Div Dis16, 203.pdf

Abstract: Aim Conifers are invasive species in many parts of the world, especially in the Southern Hemisphere. There are many introduced conifers in Europe, but their status as alien species is poorly documented. We conducted a comprehensive literature review to ascertain the extent to which alien conifers can be considered invasive. Location Europe. Methods We reviewed the historical record of alien conifer invasion in Europe (i.e. species with a native range outside the continental boundaries of Europe) by screening the DAISIE database and the ISI Web of Science. Results According to DAISIE, there are 54 alien conifer species in Europe. Pseudotsuga menziesii is the species recorded as naturalized in the most countries (12) and the UK is the country with the most naturalized species (18). Thirty-seven of these conifers have been studied, to some extent, in a total of 131 papers (212 records). Nevertheless, only a few papers have investigated aspects related to biological invasions. In fact, the species are not referred to as alien by the authors in more than half of the papers (66%). Twenty-five per cent of the papers have investigated plant traits, 46% are about biotic and abiotic factors influencing tree performance and 29% deal with ecological and economic impacts. Most papers are related to entomology, dealing with natural enemies affecting the alien conifers. Main conclusions Scientists have not yet perceived alien conifers in Europe as problematic species. Moreover, the low introduction effort, long lag-time since plantation and phylogenetic closeness between alien and native conifers are possible reasons for their low expansion in Europe to date. From a management point of view, careful observations of sites with alien conifers is necessary to watch for new invasions. From a scientific perspective, thorough analyses of the extent that introduction, rates of naturalization and biogeographical differences influence invasive spread between the two hemispheres will prove timely.

Keywords: Authors, Biological Invasions, Biological Invasions, Ecology, Elatobium-Abietinum Walker, Europe, Forest, Green Spruce Aphid, Isi, Literature, Literature Review, Management, Methods, Natural Enemies, Naturalization Hypothesis, Papers, Phylogenetic Relatedness, Picea-Sitchensis, Pinus-Radiata, Plant, Plant Invasions, Propagule Pressure, Review, Science, Screening, Sitka Spruce, South-America, Tree Invasions, UK, Web of Science

# Title: DNA Repair

Full Journal Title: [DNA Repair](http://www.sciencedirect.com/science/journal/15687864)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1568-7864

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Friedberg, E.C. (2003), Impact factors - and all that jazz. *DNA Repair*, **2** (8), 837-838.

Full Text: [2003\DNA Rep2, 837.pdf](2003/DNA%20Rep2,%20837.pdf)

? Friedberg, E.C. (2005), Journal impact factor, 2004. *DNA Repair*, **4** (10), 1066-1067.

Full Text: [2005\DNA Rep4, 1066.pdf](2005/DNA%20Rep4,%201066.pdf)

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Full Text: [2010\DNA Rep9, 1018.pdf](2010/DNA%20Rep9,%201018.pdf)

Keywords: Bibliometrics, Impact Factor, Journals

# Title: Doboku Gakkai Bombun Hokokushu

Full Journal Title: Doboku Gakkai Bombun Hokokushu

ISO Abbreviated Title:

JCR Abbreviated Title: Dokl Bolg Akad Nauk

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Tsuno, H., Nishimura F. and Somiya, I. (1994), Removal of ammonium nitrogen in bio-zeolite reactor. *Doboku Gakkai Bombun Hokokushu*, **503**, 159-166.

# Title: Document, Information & Knowledge

Full Journal Title: [Document, Information & Knowledge](http://e48.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=TSQC&NaviLink=%e5%9b%be%e4%b9%a6%e6%83%85%e6%8a%a5%e7%9f%a5%e8%af%86)

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JCR Abbreviated Title:

ISSN: 1003-2797

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Fang, Y.P. (2006), A statistical analysis on the papers and authors of document, information and knowledge since its’s transforming edition. *Document, Information & Knowledge*, **112**, 109-113.

Full Text: [2006\Doc Inf Kno112, 109.pdf](2006/Doc%20Inf%20Kno112,%20109.pdf)

Abstract: Applying bibliometric statistical methods to count and analysis the papers and authors delivered in Document, Information and Knowledge since transforming edition, he expounds their characteristics.

Keywords: Document, Information and Knowledge Papers’ Analysis Authors’ Analysis Bibliometrics

# Title: Documentation

? Bradford, S.C. (1953), Documentation (2nd ed.), London: Croshy Lockwood & Son, pp. 154.

# Title: Dokladi Na Bolgarskata Akademiya Na Naukite

Full Journal Title: Dokladi Na Bolgarskata Akademiya Na Naukite

ISO Abbreviated Title:

JCR Abbreviated Title: Dokl Bolg Akad Nauk

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bliznakov, G.M., Marinova, T.S. and Kiskinova, M.P. (1976), Kinetics of adsorption and desorption of oxygen on Pd. *Dokladi Na Bolgarskata Akademiya Na Naukite*, **29** (1), 93-95.

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# Title: Doklady Akademii Nauk

Full Journal Title: Doklady Akademii Nauk

ISO Abbreviated Title: Dokl. Akad. Nauk.

JCR Abbreviated Title: Dokl Akad Nauk+

ISSN: 0869-5652

Issues/Year: 36

Journal Country/Territory: Russia

Language: English

Publisher: Mezhdunarodnaya Kniga

Publisher Address: 39 Dimitrova UL., 113095 Moscow, Russia

Subject Categories:

Multidisciplinary Sciences: Impact Factor

Notes: IIsotherm

Dubinin, M.M. and Radushkevich, L.V. (1947), On the characteristic curve equation for active charcoals. *Doklady Akademii Nauk*, **15** (4), 327-329.

Full Text: [D\Dok Aka Nau15, 327.pdf](D/Dok%20Aka%20Nau15,%20327.pdf)

? Ivashchenko, A.I., Gusyakov, V.K., Dzhumagaliev, V.A., Yeh, G., Zhukova, L.D., Zolotukhuna, N.D., Kaistrenko, V.M., Kato, L.N., Klochkov, A.A., Korolev, Y.P., Kruglyakov, A.A., Kulikov, E.A., Kurakin, V.N., Levin, B.V., Pelinovskii, E.N., Poplavskii, A.A., Titov, V.V., Kharlamov, A.A., Khramushin, V.N. and Shelting, E.V. (1996), On the 5 October 1994 Shikotan tsunami. *Doklady Akademii Nauk*, **348** (4), 532-538.

Keywords: Island-Arc, Earthquakes

# Title: Doklady Akademii Nauk Belarusi

Full Journal Title: Doklady Akademii Nauk Belarusi

ISO Abbreviated Title: Dokl. Akad. Nauk Belarusi

JCR Abbreviated Title: Dokl Akad Nauk Belarusi

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Belyi, V.A., Krasovskii, A.M., Rogachev, A.V. and Lashkevich, V.I. (1977), Kinetics of metal atom re-evaporation on adsorption and condensation stages. *Doklady Akademii Nauk Belarusi*, **21** (2), 138-141.

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# Title: Doklady Akademii Nauk SSSR

Full Journal Title: Doklady Akademii Nauk SSSR

ISO Abbreviated Title:

JCR Abbreviated Title: Dokl Akad Nauk SSSR

ISSN: 0002-3264

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Mezhdunarodnaya Kniga, Moscow

Publisher Address:

Subject Categories:

: Impact Factor

?? Dubinin, M.M. and Radushkevich, L.V. (1947), ??. *C.R. Acad. Sci. SSSR*, **55**, 327.

?? Dubinin, M.M. and Radushkevich, L.V. (1947), ??. *Doklady Akademii Nauk SSSR*, **55**, 327.

?? Dubinin, M.M. and Radushkevich, L.V. (1947), ??. *Proc. Acad. Sci. SSSR*, *Phy. Chem. Sect.*, **55**, 331.

?? Dubinin, M.M. and Radushkevich, L.V. (1947), ??. *Dokl. Akad. Nauk SSSR Ser. Khim.*, **55**, 331.

?? Dubinin, M.M. and Radushkevich, L.V. (1947), ??. *Doklady Akademii Nauk SSSR*, **55**, 627.

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# Title: Dopovidi Akademii Nauk Ukrainskoi Rsr Seriya B-Geologichni Khimichni Ta Biologichni Nauki

Full Journal Title: Dopovidi Akademii Nauk Ukrainskoi Rsr Seriya B-Geologichni Khimichni Ta Biologichni Nauki

ISO Abbreviated Title:

JCR Abbreviated Title: Dopov Akad Nauk Ukr Rsr B-Geo

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

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Subject Categories:

: Impact Factor

? Marutovsky, P.M. (1980), On calculation of intraparticle binary mixture adsorption- kinetics. *Dopovidi Akademii Nauk Ukrainskoi Rsr Seriya B-Geologichni Khimichni Ta Biologichni Nauki*, (10), 53-56.

# Title: Drug and Alcohol Review

Full Journal Title: Drug and Alcohol Review

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ISSN:

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Journal Country/Territory:

Language:

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Publisher Address:

Subject Categories:

: Impact Factor

? Rehm, J., Taylor, B., Mohapatra, S., Irving, H., Baliunas, D., Patra, J. and Roerecke, M. (2010), Alcohol as a risk factor for liver cirrhosis: A systematic review and meta-analysis. *Drug and Alcohol Review*, **29** (4), 437-445.

Abstract: Introduction and Aims. Alcohol is an established risk factor for liver cirrhosis. It remains unclear, however, whether this relationship follows a continuous dose-response pattern or has a threshold. Also, the influences of sex and end-point (i.e. mortality vs. morbidity) on the association are not known. To address these questions and to provide a quantitative assessment of the association between alcohol intake and risk of liver cirrhosis, we conducted a systematic review and meta-analysis of cohort and case-control studies. Design and Methods. Studies were identified by a literature search of Ovid MEDLINE, EMBASE, Web of Science, CINAHL, PsychINFO, ETOH and Google Scholar from January 1980 to January 2008 and by searching the references of retrieved articles. Studies were included if quantifiable information on risk and related confidence intervals with respect to at least three different levels of average alcohol intake were reported. Both categorical and continuous meta-analytic techniques were used to model the dose-response relationship. Results. Seventeen studies met the inclusion criteria. We found some indications for threshold effects. Alcohol consumption had a significantly larger impact on mortality of liver cirrhosis compared with morbidity. Also, the same amount of average consumption was related to a higher risk of liver cirrhosis in women than in men. Discussion and Conclusions. Overall, end-point was an important source of heterogeneity among study results. This result has important implications not only for studies in which the burden of disease attributable to alcohol consumption is estimated, but also for prevention. [Rehm J, Taylor B, Mohapatra S, Irving H, Baliunas D, Patra J, Roerecke M. Alcohol as a risk factor for liver cirrhosis: A systematic review and meta-analysis. Drug Alcohol Rev 2010].

Keywords: Alcohol, Alcohol Consumption, Ascitic Cirrhosis, Assessment, Burden, Case-Control Studies, Cirrhosis, Confidence Intervals, Consumption, Disease, Dose-Response, Dose-Response Data, Drinking Patterns, Embase, Global Burden, Google Scholar, Hardly Ever, Impact, Information, Literature, Liver Cirrhosis, Medline, Meta-Analysis, Methods, Model, Morbidity, Mortality, Mortality, Prevention, Quantitative, Review, Risk, Science, Systematic, Systematic Review, Trend Estimation, Web of Science, Wine, Women

# Title: Drug and Chemical Toxicology

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Publisher: Marcel Dekker Inc

Publisher Address: 270 Madison Ave, New York, NY 10016

Subject Categories:

Chemistry: Impact Factor

Pharmacology & Pharmacy: Impact Factor181 (2000)

Toxicology: Impact Factor

? Sugawara, C., Sugawara, N., Ikeda, N., Okawa, H., Okazaki, T., Otaki, J., Taguchi, K., Yokokawa, K. and Miyake, H. (1987), Effects of ingested 4000 ppm aluminum on the essential metals, especially zinc, in intact and ethanol treated mice. *Drug and Chemical Toxicology*, **10** (3-4), 195-207.

Abstract: The effects of ingested Al on the essential metals were investigated using mice. Animals were divided into 4 groups: 1) Control, 2) Al, 3) EtOH and 4) Al+EtOH groups. Powdered commercial food, containing 1.26% P, 1.36% Ca, 70ppm Zn, 15ppm Cu, 200ppm Fe and 3.1ppm Al, was used to prepare the diets. For Al-treated groups, Al (AlCl3) was added to powdered food at a concentration of 4000ppm. The co-existing effect of EtOH which is known to affect the essential metals, was also investigated as a possible modulater of Al toxicity at a concentration of 5% for 22 days, followed by 10% for 36 days in the drinking water. After 58 days feeding with food containing Al and / or EtOH containing water, the Al effects on serum and femur P and Ca were found to be slight except for a significant decrease of serum P concentration in the Al+EtOH group. In this group, femur weight was less and femur Al concentration was more compared with the Al group. The effects on Fe and Cu were little. We observed a significant decrease of serum Zn concentration with 4000ppm Al diet in both the Al-treated groups. The fact that serum ALPase activity, a Zn enzyme, increased in disregard of a significant decrease of serum Zn concentration suggested the enzyme release from injures tissues. It is noticeable that a significant decrease of serum Zn concentration was observed when dietary Zn was sufficient. It is reported that the dietary intake of Zn is under the recommended allowance for many people. Since Al compounds are widely used as drugs, food additives and a conditioned latent Zn deficiency is rather common in human diseases, the effects of Al on the Zn metabolism are to be investigated further.

# Title: Drug Development Research

Full Journal Title: Drug Development Research

ISO Abbreviated Title:

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ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Rajpal, D.K., Kumar, V. and Agarwal, P. (2011), Scientific literature mining for drug discovery: A case study on obesity. *Drug Development Research*, **72** (2), 201-208.

Full Text: [2011\Dru Dev Res72, 201.pdf](2011/Dru%20Dev%20Res72,%20201.pdf)

Abstract: Obesity is currently an epidemic that affects almost 15% of the global adult population. The complex metabolic processes involved in energy homeostasis, which are regulated by signals from multiple sources, present a challenging problem for drug discovery. In the current analysis, we present bibliometric and data-mining approaches based on categorizing literature according to medical subject headings (MeSH) to examine “hot” and “cold” trends, which indicate emerging areas of scientific research within obesity. This trend analysis corrects for increase in the overall size of obesity publications. A “hot” trend within obesity research is a concept on which publications are growing statistically faster than the background rise in obesity publications. In addition to growth in the number of publications associated with gastrointestinal weight-loss surgery and clinical studies in obesity, there is increasing research in the fields of adipose tissue, islet cell, and enteroendocrine biology as observed by a significant increase in the number of publications during the period 2005-2009, when compared to 2000-2004. However, the number of the publications in the area of hypothalamic and nervous system research in obesity appears to be cooling off. Extending the same concept of trend analysis to genes, we present a list of obesity-related genes that show “hot” trends suggesting emerging molecular mechanisms for obesity. Finally, we present a list of key scientific publications associated with obesity, one from each year over the last decade, which have the highest number of citations. Drug Dev Res 72: 201-208, 2011. (C) 2010 Wiley-Liss, Inc.

Keywords: Adipose Tissue, Adult, Analysis, Bibliometric, Bibliometrics, Biology, Brain, Citations, Clinical, Clinical Studies, Data Mining, Data-Mining, Datamining, Discovery, Drug, Drug Discovery, Energy, Epidemic, Fat, Genes, Global, Growth, Humans, Literature, Mar, Mechanisms, Medical, Molecular Targets, Obesity, Population, Publications, Research, Scientific Publications, Scientific Research, SI, Size, Sources, Surgery, Text Mining, Therapy, Trend, Trend Analysis, Trends

# Title: Drug Information Journal

Full Journal Title: Drug Information Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

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Subject Categories:

: Impact Factor

? Thompson, D.F. and Williams, N.T. (2007), Tracking the growth of drug therapy literature using PubMed. *Drug Information Journal*, **41** (4), 449-455.

Abstract: The biomedical literature has exploded over the post 50 years. The purpose of this study was to track the growth of drug therapy literature using the online provider PubMed. We utilized the first 20 Disease [C] MeSH listed on the 2005 MeSH tree structures for our study. Drug therapy literature was searched using the disease MeSH with the ending /drug therapy or /chemically induced. Publication numbers were compiled each year from 1966 to 2003. Disease articles increased by 612% from 1966 to 2003. Drug therapy articles increased by 1, 116% during the some period. As a percentage of all disease articles, drug therapy publications increased from 11% to 18% over this time period. Drug therapy review articles grew by 10,521% over the time period; drug therapy randomized clinical trials increased by 5,228%. Geriatric drug therapy articles increased at a greater rate than pediatric literature (1,210% vs. 637%). Infectious disease (14%), oncology (14%), immunologic diseases (10%), cardiovascular disease (9 To), and neurologic/psychiatric diseases (8%) constitute the highest percentages of all drug therapy articles. Drug therapy literature is growing at a faster rate than the disease literature on PubMed. Drug therapy review articles alone are approaching 10,000 articles/year and are the fastest growing subsection of the drug therapy literature on PubMed.

Keywords: Bibliometrics, Biomedical Publications, Cardiovascular, Cardiovascular Disease, Clinical, Clinical Trials, Disease, Diseases, Drug, Drug Literature, Geography, Growth, Oncology, Pediatric, Publications, Pubmed, Randomized, Randomized Clinical Trials, Rate, Recommendations, Review, Therapy, Tree

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? Hegeman, J., van den Bemt, B.J.F., Duysens, J. and van Limbeek, J. (2009), NSAIDs and the risk of accidental falls in the elderly a systematic review. *Drug Safety*, **32** (6), 489-498.

Full Text: [2009\Dru Saf32, 489.pdf](2009/Dru%20Saf32,%20489.pdf)

Abstract: Accidental falls, especially those occurring in the elderly, are a major health and research topic nowadays. Besides environmental hazards and the physiological changes associated with aging, medication use (e.g. benzodiazepines, vasodilators and antidepressants) and polypharmacy are significant risk factors for falling as well. Exposure to NSAIDs has been associated with accidental falls too, although information on this area is less consistent. Therefore, the main goal of this review is to provide an updated overview of all the evidence published on the risk of falling due to NSAID use thus far. A systematic literature search for material published between 1966 and March 2008 in PubMed, EMBASE, the Cochrane Database of Systematic Reviews, Exerpta Medica, Current Contents and Science Citation Index was combined with a check of the reference lists of all the retrieved articles. Validity and data extraction of the eligible articles was assessed by adapted criteria, based on checklists that were originally developed to assess case-control or cohort studies. From the 16 selected articles, two studies were rejected because of clustering of data and one article was excluded because it contained the same data as that in one of the included articles. None of the articles retrieved included a randomized controlled trial. The remaining 13 studies all showed some lack in completeness of their statistical methods, and much variation in reporting of effects. The overall mean age was high in the study populations, leaving the results to be poorly generalizable to a larger population and other age categories. Despite these imperfections, all studies showed an increased risk of failing due to NSAID use (four significant, nine non-significant), and a tendency towards an increased fall risk with NSAID exposure could be noted. The results shown in the present review suggest that an increased risk for accidental falls is probable when elderly individuals are exposed to NSAIDs. The studies with the highest quality show that the community-dwelling elderly in particular appear to be at higher risk. This review can serve as a comprehensive overview of the published evidence on fall risk of elderly individuals attributable to the use of NSAIDs, and as an inducement for future research.

Keywords: Chronic Diseases, Citation, Drug-Use, Injurious Falls, Medication Use, Multiple Falls, Nursing-Home Residents, Older-People, Prescription, Quality, Research, Risk Factors, Science, Term Care Facility, Women

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Subject Categories:

: Impact Factor

? Thevis, M., Kuuranne, T., Geyer, H. and Schanzer, W. (2009), Annual banned-substance review: The Prohibited List 2008-analytical approaches in human sports drug testing. *Drug Testing and Analysis*, **1** (1-2), 4-13.

Abstract: The list of prohibited substances and methods of doping issued by the World Anti-Doping Agency is updated and modified annually based on most recent developments and scientific data. Compounds and methods are maintained, added, or removed from the list, or they are placed in so-called monitoring programmes that have been established to obtain reliable data on the prevalence of particular substances and methods in- and/or out-of-competition. Consequently, doping control laboratories continuously update, modify and optimize existing screening and confirmation assays to ensure utmost comprehensiveness in detecting the prohibited and monitored substances as well as chemically and pharmacologically related analogs. The annual banned-substance review for human sports drug testing critically summarizes recent innovations in analytical approaches supporting the detection of established and newly outlawed substances and methods of doping. Literature from January 2007 through September 2008 as indexed in MEDLINE and Web of Science was screened and articles on detection methods for substances and methods of doping in humans were compiled according to the 2008 Prohibited List of the World Anti-Doping Agency. Few new approaches were presented for individual doping agents and the majority of reports demonstrated new options for increasing the comprehensiveness of existing doping control assays. In addition, new techniques in separation and/or ionization of analytes complementary to commonly used procedures were described, which, so far, did not meet all requirements of sports drug testing. Copyright (C) 2009 John Wiley & Sons, Ltd.

Keywords: Analysis, Androgen Receptor Modulators, Control, Copyright, Desorption Electrospray-Ionization, Detection Method, Doping, Doping-Control Analysis, Drug, Endogenous Urinary Steroids, Gel Electrophoresis, Homologous Blood-Transfusion, Human, Human Chorionic-Gonadotropin, Humans, Ionization, Mass Spectrometry, Monitoring, Performance Liquid-Chromatography, Prevalence, Review, Science, Screening, Solid-Phase Extraction, Sport, Sports, Synthetic Anabolic-Steroids, Tandem Mass-Spectrometry, Web of Science

# Title: Drugs

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Publisher Address: 41 Centorian Dr, Private Bag 65901, Mairangi Bay, Auckland 10, New Zealand

Subject Categories:

Pharmacology & Pharmacy: Impact Factor181 (2000)

Toxicology: Impact Factor

? Karppanen, H. (1984), Ischaemic heart disease. An epidemiological perspective with special reference to electrolytes. *Drugs*, **28** (1), 17-27.

Abstract: Ischaemic heart disease (IHD) is a major public health problem in most industrialised countries. In the death rates from IHD, marked differences exist between various countries and also between different areas of individual countries. Unfavourable dietary factors appear to play an important role in the aetiology of IHD, and thus differences in dietary habits and the quality of food may be mainly responsible for the geographic differences in the prevalence of IHD. The present liberal use of salt as well as the refining and other industrial processing of food increase the content of sodium and decrease the content of potassium and magnesium in the diet. The high intake of sodium and the inadequately low levels of potassium and magnesium in the diet predispose to the development of arterial hypertension. Since arterial hypertension is a major risk factor of IHD, the distorted electrolyte composition of our present diet can be considered an important aetiological factor of this disease. To decrease the body burden of sodium, diuretic agents are frequently used. Unfortunately, in the presence of the relatively low content of potassium and magnesium in the diet, the diuretic-induced increases in the excretion of these electrolytes commonly decrease the potassium and magnesium levels in the body. The falls in potassium and magnesium may increase the death rate from IHD by predisposing the heart to fatal arrhythmias, and also by other mechanisms. The likelihood of magnesium deficiency also appears to be influenced by the area of residence. The higher-than-average death rates from IHD in the so-called North Karelia area in eastern Finland and in some other areas with exceptionally high death rates from this disease may be at least partly due to the very low levels of magnesium in the soil and drinking water. It can be concluded that electrolyte disturbances have important implications in the aetiology and pathogenesis of IHD.

? Jacobs, M.R. (1999), Activity of quinolones against mycobacteria. *Drugs*, **58**, 19-22.

Abstract: The fluoroquinolones have been shown to be active in vitro against many mycobacterial species, including most strains of *Mycobacterium tuberculosis* complex and M. fortluitum, and some strains of M. kansasii, M. avium-intracellulare (MAI) complex and M. leprae. Ciprofloxacin, ofloxacin and sparfloxacin are the best studied of these agents to date, and are among the most active of this group against M. tuberculosis and other mycobacteria. Treatment of patients with multidrug-resistant pulmonary tuberculosis using ofloxacin has resulted in the selection of quinolone-resistant mutants in a few patients. Many strains of MAI, however, are resistant to fluoroquinolones, and structure-activity relationships and DNA gyrase studies have been undertaken to identify the moieties associated with activity and the lack thereof. The genetic and molecular basis of quinolone resistance in mycobacteria has revealed both the recent progress made in these areas and the limitations of the quinolones against this genus. Considerable progress will need to be made in resolving these issues in order for the quinolones to become clinically useful antimycobacterial agents

Keywords: Avium, Drugs, Fluoroquinolones, Gyrase, In-Vitro Activity, Macrolides, Mutations, *Mycobacterium tuberculosis*, Quinolones, Resistance, Sparfloxacin, Tuberculosis

? Bastian, I. and Colebunders, R. (1999), Treatment and prevention of multidrug-resistant tuberculosis. *Drugs*, **58** (4), 633-661.

Abstract: Multidrug-resistant tuberculosis (MDRTB), which is defined as combined resistance to isoniazid and rifampicin, is a ‘man- made’ disease that is caused by improper treatment, inadequate drug supplies or poor patient supervision. Patients with MDRTB face chronic disability and death, and represent an infectious hazard for the community. Cure rates of 96% have been achieved but require prompt recognition of the disease, rapid accurate susceptibility results, and early administration of an individualised re-treatment regimen. Such regimens are usually based on a quinolone and an injectable agent (i.e. an aminoglycoside or capreomycin) supplemented by other ‘second- line’ drugs. This therapy is prolonged (e.g. 24 months), expensive, and has multiple adverse effects. Prevention of MDRTB is therefore of paramount importance. The World Health Organization (WHO) has recommended a multifaceted programme, known by the acronym DOTS (directly observed therapy, short- course), that promotes effective treatment of drug-susceptible TB as the prime method of limiting drug resistance. DOTS was part of a successful MDRTB control programme in New York City, which also included treatment of prevalent MDRTB cases, streamlined laboratory testing, effective infection control procedures and wider application of screening and preventive therapy (although the optimal chemotherapy for MDRTB infection remains undefined). Industrialised countries have the resources to treat patients with MDRTB and to mount these extensive control programmes. Unfortunately, MDRTB is also prevalent in Asia, South America and the former Soviet Union. First world countries have a vested interest, as well as a moral responsibility, to assist in controlling MDRTB in these ‘hot spots’

Keywords: Diagnosed Pulmonary Tuberculosis, Directly Observed Therapy, Drug-Resistance, Drugs, Health-Care Workers, HIV- Infected Patients, Human-Immunodeficiency-Virus, In-Vitro, *Mycobacterium tuberculosis*, New-York-City, Resistance, Short-Course Chemotherapy, Tuberculosis

# Title: Drugs & Aging

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Language: English

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Publisher Address: 41 Centorian Dr, Private Bag 65901, Mairangi Bay, Auckland 10, New Zealand

Subject Categories:

Geriatrics & Gerontology: Impact Factor 2.342, / (2000)

Pharmacology & Pharmacy: Impact Factor 2.342, / (2000)

? Sankaran, S.K. (1996), Osteoporosis prevention and treatment: Pharmacological management and treatment implications. *Drugs & Aging*, **9** (6), 472-477.

Full Text: Dru Agi9, 472.pdf

Abstract: In the current economic climate, osteoporosis is a major public health issue because of the high rate of fractures associated with the disease. Prevention of osteoporosis is a cost-effective approach, especially in aging populations. Encouraging moderate exercise and dietary supplementation with calcium and vitamin D, especially in institutionalised elderly people, are the major nonpharmacological management measures used to prevent and treat osteoporosis. Pharmacological measures have been developed in the last few years and extensive research is under way. Hormone replacement therapy res, lts in increased bone mass, especially in postmenopausal patients. and its effect is currently being investigated in the elderly population. The bisphosphonates. especially alendronate, are promising and have few adverse effects. but the issue of cost needs to be addressed. Pharmacological agents that stimulate bone formation, such as sodium fluoride, growth hormone and other trophic factors, are being researched.

Keywords: Bone-Mineral Density, Postmenopausal Osteoporosis, Fracture Rate, Replacement Therapy, Sodium-Fluoride, Breast-Cancer, Risk-Factors, Women, Calcium, Estrogen

? Kindermann, S.S., Dolder, C.R., Bailey, A., Katz, I.R. and Jeste, D.V. (2002), Pharmacological treatment of psychosis and agitation in elderly patients with dementia - Four decades of experience. *Drugs & Aging*, **19** (4), 257-276.

Full Text: Dru Agi19, 257.pdf

Abstract: A number of studies, using different research designs and assessment instruments, have been conducted to elucidate the differential effects of drug treatments for psychosis, agitation and aggression in elderly patients with dementia. We have reviewed literature published from 1960 to 2000 on this topic; 48 studies that met our selection criteria were identified from Medline and Science Citation Index. Antipsychotic medication was generally effective for the treatment of psychosis and agitation in elderly patients with dementia. In double-blind, placebo-controlled trials in this population, mean improvement rates were 61% with antipsychotics and 35% with placebo. Atypical antipsychotics appeared promising, but the number of well-designed studies has been small so far. Methodological limitations of the studies reviewed are discussed; future trials should ensure adequate sample size and duration and involve direct comparisons of individual medications. In conclusion, conventional antipsychotics are modestly effective for treatment of psychosis and agitation in elderly individuals with dementia, whereas newer treatments such as atypical antipsychotics appear to be at least as effective while having fewer adverse effects. Nonetheless, there is no currently available ideal pharmacotherapy, and psychosocial management is a necessary part of overall treatment, Additional large-scale, well-controlled studies are needed before conclusive statements regarding the value of treatment of psychosis and agitation with atypical antipsychotics and non-antipsychotic agents can be made.

Keywords: Aggression, Alzheimers-Disease, Antipsychotic-Drugs, Assessment, Behavioral Disturbances, Carbamazepine Treatment, Citation, Criteria, Dementia, Double-Blind Trial, Elderly, Instruments, Literature, Management, Medline, Neuroleptic Drugs, Nursing-Home Patients, Organic Brain-Syndrome, Placebo, Placebo-Controlled Trial, Psychosis, Research, Science, Science Citation Index, Selection, Tardive-Dyskinesia, Topic, Treatment

# Title: Drustvena Istrazivanja

Full Journal Title: Drustvena Istrazivanja

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1330-0288

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Maricic, S., Sorokin, B. and Papes, Z. (2000), Croatian journals at the end of the 20 century: A bibliometric evaluation. *Drustvena Istrazivanja*, **9** (1), 1-17.

Full Text: 2000\Dru Ist9, 1.pdf

Abstract: There are in Croatia 241 journals appearing at least twice a year. They make for about 2/3 of those periodic publications whose contents are recorded in the Croatian Bibliography. Series B, contributions in journals and proceedings. Their scientific communicability (sci.comm.) was evaluated by four indicators: peer review, language, timeliness/regularity, and foreign authorship, journals from the natural and applied-technical sciences (NT) faired considerably better than those from the social sciences and humanities (SH). This dichotomy was also apparent in the 1990 to 1995 comparison. Although there were no dramatic changes, the sci. comm. did improve, and more so for the NT-journals. New SH-journals more frequently appeared and ceased. Hence, the criteria for decision making in science policy must not be identical for all types of journals. The results of the sci. comm. evaluation by our method is congruent with the coverage of Croatian journals in the international secondary information services. This flow into the “capillary” system of scientific information exchange leads to a reasonable “visibility” of Croatian journals via the ISI-journals.

Keywords: Science-Citation-Index, Scientists, System

# Title: Drying Technology

Full Journal Title: [Drying Technology](http://www.informaworld.com/smpp/title~content=t713597247~tab=sample)

ISO Abbreviated Title: Dry. Technol.

JCR Abbreviated Title: Dry Technol

ISSN: 0737-3937

Issues/Year: 6

Journal Country/Territory: United States

Language: English

Publisher: Marcel Dekker Inc

Publisher Address: 270 Madison Ave, New York, NY 10016

Subject Categories:

Engineering, Chemical: Impact Factor 0.402, /

Engineering, Mechanical: Impact Factor 0.402, /

? Chakraverty, A. and Devadattam, D.S.K. (1987), Sorption and desorption characteristics of raw and heat-treated rice bran. *Drying Technology*, **5** (2), 205-212.

? Jaafar, F. and Michalowski, S. (1990), Modified BET equation for sorption desorption isotherms. *Drying Technology*, **8** (4), 811-827

? Markowski, A.S. (1993), Quality Interaction in a jet spouted bed dryer for bio-products. *Drying Technology*, **11** (2), 369-387.

Abstract: An experimental study was conducted to apply the jet spouted bed (JSB) dryer with inert bodies for drying of fodder antibiotics (zinc-salt bacitracin and tylosin) and baker’s yeast which are extracted from fermentation broth. After establishing the drying properties of these products (e.g. sorption isotherm, water activity and thermostability), the influence of basic drying parameters (temperature of drying agent, bed loading, gas flow rate) on drying characteristics and quality of the products was determined. The results proved that a JSB dryer may be successfully applied to fodder antibiotics, especially to Zn-bacitracin, however, for a highly labile live organism like baker’s yeast, this method cannot be used. The optimal parameters for drying of Zn-bacitracin have been presented.

Keywords: Baker’s Yeast, Conical Dryer, Convective Drying, Fodder Antibiotics, Isotherm, Optimal Drying Parameters, Yeast

? Sun, D.W. and Woods, J.L. (1993), The moisture-content relative-humidity equilibrium relationship of wheat: A review. *Drying Technology*, **11** (7), 1523-1551.

Abstract: Thirty three sources of hygroscopic data for wheat are identified. Gravimetric methods predominate in the literature, followed by hygrometric methods which largely employ a dew point technique for relative humidity determination. Hysteresis effects vary considerably in magnitude. The greatest difference between adsorption and desorption isotherms occurs in the 20-40% RH region. A table of equilibrium moisture contents interpolated from the data sets is presented for a fixed set of temperatures and RH to enable comparison. The isotherm equations used to fit the data are also reviewed. The Strohman-Yoerger, Modified-Oswin, Modified-Chung-Pfost, Chen-Clayton and Modified-Henderson equations are identified as the most suitable. Further investigation is needed to compare them.

Keywords: Adsorption, Desorption, Grain, Isotherms, Literature Survey, Equations, Corn

? Dietl, C., George, O.P. and Bansal, N.K. (1995), Modeling of diffusion in capillary-porous materials during the drying process. *Drying Technology*, **13** (1-2), 267-293.

Abstract: This paper presents a model of heterogenous diffusion in capillary porous materials during the process of drying. The governing heat and mass transfer equations have been established using the liquid as well as vapor flow. Two models have been presented. Model 1 does not consider the heat conduction while the model 2 has been established by considering the conduction. The developed models and the numerical solutions of the resulting differential equations can take into account the moisture and temperature dependent thermophysical properties of the product. All equations have been established in spherical coordinates but the programme written for the purpose of calculations can be used for other geometries also. Numerical calculations have been performed for gas concrete and tiles using model 1, while model 2 has been used for gas concrete only because of the lack of data for thermophysical properties of the tile. For gas concrete it was seen that conduction has only marginal effect on the drying process and the numerical predictions of the drying process were reasonably accurate.

Keywords: Capillary and Bulk Diffusion, Heat and Mass Transfer, Vapor Flow, Mass-Transfer, Heat

? Kaminski, W., Mitura, E. and Tomczak, E. (1996), Effect of thermal processing and addition of carriers on water sorption isotherms in baker’s yeast. *Drying Technology*, **14** (2), 245-258.

Abstract: Properly chosen additives (carriers) can protect the material or decrease water content in it. The paper presents results of measurements of sorption isotherms of baker’s yeast *Saccharomyces cerevisiae* dried in an oven dryer and in a fluidized bed with and without carriers. The authors propose an original method for calculation of sorption isotherms for multicomponent mixtures containing yeast. Results of the calculations were compared with experimental data.

Keywords: Baker’s Yeast, Calculation, Mixtures, *Saccharomyces Cerevisiae*, Sorption Isotherms, Yeast

? Maskan, M. and Karatas, S. (1997), Sorption characteristics of whole pistachio nuts (Pistacia vera L). *Drying Technology*, **15** (3-4), 1119-1139.

Abstract: Moisture sorption characteristics of whole pistachio nuts were investigated at 10, 20, and 30°C using the static method. The sorption isotherms exhibited hysteresis over the range of 0.10-0.80 water activity which was succesfully interpreted using BET, GAB, Oswin, Smith, Henderson, Chung-Pfost and Halsey mathematical models and from which the BET, GAB and Oswin models were found to give the best fit. Monolayer moisture content of pistachio nuts was determined from BET and GAB equations and the isosteric heat of sorption data were derived using Clausius-Clapeyron equation and presented in graphical form. The information generated can be utilized to optimize the packaging parameters for long term storage of pistachio nuts.

Keywords: Adsorption/Desorption, Isosteric Heat, Isotherms, Monolayer, Pistachio Nuts, Sorption Models, Moisture Sorption, Water Sorption, Isotherm Equations, Foods, Products, Temperature, Raisins, Meat

? Sun, D.W. (1998), Selection of EMC/ERH isotherm equations for shelled corn based on fitting to available data. *Drying Technology*, **16** (3-5), 779-797.

Abstract: Five hundred and ninety-one experimental EMC/ERH data points for shelled corn are extracted from twenty publications identified in literature. These data are grouped into adsorption, desorption, average, yellow dent, dent and yellow flint data sets according to varieties and sorption processes. Thirteen out of the twenty publications contain data over a wide range of temperatures, thus producing nineteen data sub-sets suitable for comparing EMC/ERH isotherm equations. Three commonly cited shelled corn EMC/ERH equations (Modified-Henderson, Modified-Chung-Pfost and Modified-Oswin equations) are evaluated for their ability to fit these nineteen data sub-sets. The evaluation, based on the residual sum of squares (RSS), standard error of estimate (SEE) and mean relative deviation (MRD), shows that the Modified-Oswin and Modified-Chung-Pfost equations have a better ability to describe the EMC/ERH isotherms of shelled corn, with the Modified-Oswin equation slightly better than the Modified-Chung-Pfost equation. Both equations are then used to fit the adsorption, desorption, average, yellow dent, dent and yellow flint data sets and the best fitted coefficients are given. These fitted equations are based on a large data set and therefore provide a sound basis for future work on drying and storage of shelled corn.

Keywords: Adsorption, Desorption, Drying, Equilibrium Moisture Content, Equilibrium Relative Humidity, Modified-Chung-Pfost Equation, Modified-Oswin Equation, Maize, Moisture Transfer Characteristics, Humidity Equilibrium, Sorption Isotherms, Wheat, Models, Grains

? Adam, E., Muhlbauer, W., Esper, A., Wolf, W., Spiess, W. (2000), Effect of temperature on water sorption equilibrium of onion (Allium cepa L.). *Drying Technology*, **18** (9), 2117-2129.

Abstract: Results of the experimental measurement of sorption isotherms at different temperatures obtained by the standard gravimetric method showed the typical sigmoid shape of products rich in carbohydrates. The temperature had the expected effect predicted by the theory of physical adsorption i.e the quantity of sorbed water at a given water activity increased as the temperature decreased. The amount of adsorbed or desorbed water per unit weight of solid depends on the equilibrium temperature. The increase of the temperature results in increase of water activity for the same moisture content which in increases the rates of reactions leading to quality deterioration. As the water activity is raised beyond the intermediate region, water is sorbed by low molecular weight constituents resulting in shifting the isotherm upward. The values of the net isosteric heal of desorption were found to be higher than those or adsorption, which indicates that the binding energy for the latter is higher. At low moisture content the heats of desorption is much higher than that of adsorption.

Keywords: Onion, Sorption Isotherms, Mathematical Modelling, Moisture-Content, Isotherms, Foods, Heat

? Hashimoto, A., Nakanishi, K. and Kameoka, T. (2004), Water sorption analysis on vegetables using modified Dubinin-Astakhov parameters. *Drying Technology*, **22** (1-2), 225-236.

Full Text: [2004\Dry Tec22, 225.pdf](2004/Dry%20Tec22,%20225.pdf)

Abstract: The parameters of a modified Dubinin Astakhov (DA) equation were studied for six kinds of fresh vegetables. The equilibrium moisture content data were fitted to the modified DA equation under the condition that the limit of the moisture content of the adsorption space represented by M-0 was assumed to be roughly equal to the equilibrium moisture content at the relative humidity of 97.3%. Then we calculated other two DA parameters of n and A(e). The former is the distribution index of the Weibull probability density function, and the latter is a characteristic energy. In addition, the logarithm of the A(e)(n) value increased proportionally with the increase of the n value, and the A(e) value could be experimentally identified by the degree of the pore inside the vegetable. Moreover, we discussed the relationship between the DA parameter M-0 and the moisture content M-m calculated with the monolayer adsorption capacity defined by a Brunauer-Emmett-Teller equation. As the results, the logarithm of M-0 approximately represented the direct proportion to that of M-m among all tested vegetables. This showed the power low relationship between M-0 and M-m and the slope of the line could mean the fractal dimension of the moisture sorption space.

Keywords: Adsorption, Analysis, BET Equation, Capacity, Condition, Density, Distribution, Energy, Equilibrium, Fractal Dimension, Geometrical Structure, Index, Isotherms, Modified DA Equation, Moisture Content, Parameters, Probability, Relative Humidity, Sorption, Vegetable, Water Sorption

? Basu, S., Shivhare, U.S. and Mujumdar, A.S. (2006), Models for sorption isotherms for foods: A review. *Drying Technology*, **24** (8), 917-930.

Full Text: [2006\Dry Tec24, 930.pdf](2006/Dry%20Tec24,%20930.pdf)

Abstract: This article presents basic concepts related to the thermodynamics of sorption of water and measurement of sorption isotherm for food materials. A comprehensive review of the widely used sorption models is presented. Various statistical techniques used to ascertain the effectiveness of a model to describe the sorption data are discussed. It is anticipated that this article will provide useful information to researchers pursuing work on sorption behavior of food materials as well as modeling of drying processes.

Keywords: Adsorption-Isotherms, Desorption Isotherms, Enthalpy-Entropy Compensation, GAB Equation, Heat of Sorption, Isosteric Heat, Isotherm, Isotherms, Mathematical-Description, Model, Modeling, Models, Moisture Sorption, Processes, Researchers, Review, Ross Equation, Sorption, Sorption Isotherm, Sorption Isotherms, Statistical Analysis, Temperature, Thermodynamic Properties, Thermodynamics, Water, Water Sorption

? Basu, S., Shivhare, U.S. and Mujumdar, A.S. (2006), Models for sorption isotherms for foods: A review (vol 24, pg 917, 2006). *Drying Technology*, **24** (12), 1705.

Full Text: [2006\Dry Tec24, 1705.pdf](2006/Dry%20Tec24,%201705.pdf)

Keywords: Isotherms, Models, Review, Sorption, Sorption Isotherms

# Title: Duodecim

Full Journal Title: Duodecim

ISO Abbreviated Title: Duodecim

JCR Abbreviated Title: Duodecim

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Riikola, T. (1999), Annals of Medicine speedily to international recognition. *Duodecim*, **115** (14), 1502-1504.

Keywords: International

? Kovanen, P. (2000), Ann Med being renewed. *Duodecim*, **116** (19), 2063-2064.

# Title: Dyes and Pigments

Full Journal Title: [Dyes and Pigments](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5239&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=898b86ebf704bb7f2e847fc4f8122b4f)

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Subject Categories:

Chemistry, Applied: Impact Factor 0.607, 30/55 (2000), Impact Factor 1.610, 12/58 (2004); Impact Factor 1.694, 12/72 (2005); Impact Factor 1.909, 12/58 (2006)

Engineering, Chemical: Impact Factor 0.667, 38/110 (1999), Impact Factor 1.610, 14/116 (2004); Impact Factor 1.694, 17/116 (2005); Impact Factor 1.909, 11/110 (2006)

Materials Science, Textiles: Impact Factor 1.610, 1/15 (2004); Impact Factor 1.694, 2/15 (2005); Impact Factor 1.909, 1/14 (2006)

Nango, M., Tanihara, S., Maekawa, M., Katayama, A. and Kuroki, N. (1981), Adsorption of direct dye on cellulose in the presence of sodium alginate at various temperatures. *Dyes and Pigments*, **2** (1), 49-56.

Full Text: [D\Dye Pig2, 49.pdf](D/Dye%20Pig2,%2049.pdf)

Abstract: Dyeing of cellulose by Chrysophenine G (CI Direct Yellow 12) in aqueous sodium alginate solution at various temperatures has been studied. The effect of temperature change on dye adsorption equilibrium to cellulose in the presence of sodium alginate has been examined based on the previously described multiple equilibrium model. The affinities of the dye, which were calculated with an interpolated ionisation degree of the carboxyl group in the cellulose and by using the ionization degree of sodium alginate measured were nearly constant under the present dyeing conditions. These results confirm the previous conclusion that the dye is concentrated into the internal solution of cellulose due to the presence of sodium alginate in the bulk solution.

Alberghina, G., Longo, M.L. and Torre, M. (1983), Adsorption thermodynamics and diffusion of disperse anthraquinone dyes in acetate fibre. *Dyes and Pigments*, **4** (1), 49-58.

Full Text: [D\Dye Pig4, 49.pdf](D/Dye%20Pig4,%2049.pdf)

Abstract: Diffusion coefficients, thermodynamic parameters and adsorption equilibrium isotherms of some anthraquinone dyes for acetate fibre are reported. The chemical constitution seems to be more important than the size factor in determining dye diffusion into the interior of the fibres. The activation energies of diffusion decreased strongly when o-dichlorobenzene was present, due to the plasticising effect of carrier. Nernst partition isotherms were obtained, up to saturation. Substantivity decreased when water-solubilising groups are present in the molecule.

The aqueous solubilities and heats of solution have been measured, the higher ΔHw values were found for the derivatives which can form intermolecular hydrogen bonding in the crystalline state.

Amato, M.E., Fisichella, S. and Occhipinti, S. (1986), Adsorption isotherms on cotton of direct sky blue FF from aqueous ethanolic solutions. *Dyes and Pigments*, **7** (1), 1-12.

Full Text: [D\Dye Pig7, 1.pdf](D/Dye%20Pig7,%201.pdf)

Abstract: Adsorption isotherms at 80°C for Direct Sky Blue FF (C.I. Direct Blue 1) on cotton in the presence of variable amounts of NaCl (2, 10, 15 and 50 g litre-1) and ethanol (*v/v*) (0, 5, 10, 20, 30, 40, 50, 60%) were measured.

The Langmuir equation has been used to describe the equilibrium except for the measurements obtained at 15 g litre-1 of NaCl and 50 % and 60 % of ethanol, and at 50 g litre-1 of NaCl and 20 % of ethanol for which the distribution law was followed. The saturation values increased markedly with the salt concentration. The concentration of ethanol influenced the adsorption in two ways, one was a depressing action and the other an accelerating action. The increasing concentration of ethanol decreased the degree of association of the dye and the adsorption was Langmuir type, at 15 g litre-1 of NaCl and 50% and 60% ofethanol, and 50 g litre -1 of NaCl and 20% of ethanol the degree of association of the dye increased and the adsorption was distribution type.

Kamel, M.M., Youssef, B.M. and Kamel, M.M. (1991), Adsorption of anionic dyes by kaolinites. *Dyes and Pigments*, **15** (3), 175-182.

Full Text: [D\Dye Pig15, 175.pdf](D/Dye%20Pig15,%20175.pdf)

Abstract: This study outlines the kinetic rate of adsorption of three commercial anionic direct dyestuffs by two types of Egyptian kaolinite, i.e. Sinai and Kalabsha. The structure of the dyestuffs, as well as the structure of kaolinites. plays a great role in dye adsorption. The Sinai kaolinite shows a higher apparent ion-exchange capacity than the Kalabsha one. Some factors affecting dye adsorption are investigated, e.g. kaolinite and dye concentration, shaking time, temperature and addition of electrolytes.

Shukla, S.R. and Sakhardande, V.D. (1991), Dyestuffs for improved metal adsorption from effluents. *Dyes and Pigments*, **17** (1), 11-17.

Full Text: [D\Dye Pig17, 11.pdf](D/Dye%20Pig17,%2011.pdf)

Abstract: Reactive dyestuffs, widely used for dyeing cellulosic textiles, have been subjected to a novel use. Cheap cellulose-containing materials, such as bamboo pulp and sawdust, have the capacity to adsorb heavy metal ions, and this is enhanced further on dyeing these substrates with reactive dyes of the monochlorotriazine type. Almost complete removal of metal ions such as Cu2+, Pb2+, Hg2+, Fe2+, Fe3+, Zn2+, and Ni2+ from their aqueous solutions has been achieved. The role of the dyestuffin improving the metal ion adsorption is discussed.

Keywords: Adsorption, Binding, Capacity, Cupric Ion, Heavy Metal, Metal Ions, Peanut Skins, Reactive Dyes, Removal, Wool

Shukla, S.R. and Sakhardande, V.D. (1991), Removal of metal ions using dyed cellulosic materials. *Dyes and Pigments*, **17** (2), 101-112.

Full Text: [D\Dye Pig17, 101.pdf](D/Dye%20Pig17,%20101.pdf)

Abstract: Cellulosic substrates, namely sawdust, jute fibres and bamboo pulp, which had been dyed with reactive dye, were subjected to semi-continuous adsorption of different metal ions using packed columns. On passing relatively high concentrations (1200-1300 mg litre-1) of the metal ions Pb2+, Hg2+, Cu2+, Fe3+, Zn2+, Ni2+ and Fe2+ through the column at a rapid flow rate, it was found that the adsorbent columns were as effective in giving high adsorption levels as single batch experiments. The columns could be regenerated and used repeatedly for adsorbing different metal cations for a number of times without any apparent bleeding out of the dye from the substrate or any degradation of the substrate.

Keywords: Adsorption, Binding, Degradation, Metal Ions, Reactive Dye

? Morita, Z., Kai, T. and Motomura, H. (1991), Reaction and simultaneous diffusion in cellulose of reactive dyes containing a mixed bifunctional reactive system. *Dyes and Pigments*, **17** (3), 241-252.

Full Text: [1991\Dye Pig17, 241.pdf](1991/Dye%20Pig17,%20241.pdf)

Abstract: The reaction with cellulose and simultaneous diffusion into cellulose for two reactive dyes containing a 4-chloro-2-(m-vinylsulfonylanilino)-1,3,5-triazinyl group were investigated at 40-80-degrees-C, pH 7-11 and ionic strength 0.3, using the cylindrical cellophane roll method. The experimental diffusion profiles of the active and fixed species were fitted with the theoretical profiles. The relationship between log k(c) (the pseudo-first-order rate constant of reaction with cellulose) and pH gave a straight line of unit slope below pH 10.5 for both dyes at 40, 60 and 80-degrees-C, the slope decreasing at pH values above 10.5. The surface concentration decreased with increase in pH for the red dye and remained nearly constant for the orange dye, whilst their diffusion coefficients were constant. Activation energies of the reaction with cellulose were 93-95 kJ mol-1 and those of the diffusion into cellulose were 41-44 kJ mol-1. These values are within the general range for vinylsulfonyl dyes, and the adsorption behavior of the dyes was similar to that of monochlorotriazinyl dyes.

Keywords: Adsorption, Behavior, Diffusion, Experimental, Reactive Dyes

Chen, W.N., Guthrie, J.T. and Lin, L. (1992), A new method for the prediction of adsorption isotherms. *Dyes and Pigments*, **19** (2), 129-147.

Full Text: [D\Dye Pig19, 129.pdf](D/Dye%20Pig19,%20129.pdf)

Abstract: A universally applicable method of predicting the isotherms of pure gas physical adsorption equilibrium is proposed. This makes it possible to predict the equilibrium amount of adsorption using only the thermodynamic parameters of adsorbate gases, i.e. Tc, Pc, Tnbp and ω. This method is based on four assumptions related to the properties of the adsorption system, namely: (1) The adsorbed phase consists of two phases, i.e. a `pseudo-liquid’ phase and a `pseudo-vapour’ phase. (2) An adsorbent has a maximum available adsorption space, Ømax. (3) The density of the adsorbed at the surface of adsorbent, ρo, can be expressed as: where C1, C2, C3 and C4 are constants whose values depend on the characteristics of the adsorbent and Tc Pc, Tnbp and ω are the critical temperature, critical pressure, normal boiling temperature and Pitzer’s acentric factor, respectively. T and P are the temperature and the pressure at adsorption equilibrium, respectively. (4) The volume of the where, d1, d2, d3 and d4 are constants whose values are dependent on the characteristics of the adsorbent, while Tc, Pc, Tnbp and ω have the same meaning as above.

The equilibrium amount of adsorption predicted using the proposed method has been compared with experimental values. An average deviation of 9-3% between the two approaches is seen. The correlation equation obtained by analysis of data acquired for an individual adsorption system applies to other systems based on the same adsorbent coupled with a different adsorbate gas. An attractive feature of the proposed method is that prediction of adsorption isotherms using the proposed method only requires information relating to the thermodynamic properties of the adsorbate, i.e. Tc, Pc, Tnbp and ω.

Neumann, M.G., Gessner, F. and de Sena, G.L. (1992), The adsorption of basic dyes by poly(styrene sulphonate). *Dyes and Pigments*, **20** (4), 255-260.

Full Text: [D\Dye Pig20, 255.pdf](D/Dye%20Pig20,%20255.pdf)

Abstract: The adsorption of basic dyes (Safranine, Neutral Red, Acridine Orange and Proflavine) on poly(styrene sulphonate) has been studied by measuring the amount of free dye in solution using a photochemical method. Adsorption free energies are in the range 7.1-5.3 kcal/mol. Comparing the values of these energies as a function of the structure of the dyes, three different types of interactions can be postulated to contribute to the binding of the dyes to the polymer, viz., electrostatic (c. 4 kcal/mol), hydrophobic and charge-transfer.

? Qian, J., Hamada, K. and Mitsuishi, M. (1995), Sorption behaviour of fluorinated azo sulphonated dyes by silk fibre. *Dyes and Pigments*, **21** (4), 255-263.

Full Text: [D\Dye Pig21, 255.pdf](D/Dye%20Pig21,%20255.pdf)

Abstract: The sorption behaviour of sodium 1-phenylazo-2-hydroxy-6-naphthalenesulphonate and its derivatives containing a trifluoromethyl or methyl group by silk fibre under acidic conditions was investigated. For all the dyes the equilibrium sorption was established after the silk fibre was immersed in the aqueous dye solutions for 24 h. The sorption isotherms obtained were explained on the basis of the single Langmuir type sorption mechanism or the dual sorption mechanism formulated by the sum of Langmuir and partition type sorption. The number of binding sites for Langmuir type sorption was consistent with the content of amino groups in the silk fibre indicating the stoichiometric binding of the anionic dyes with the positively charged amino groups. The thermodynamic parameters calculated from the temperature dependence of the intrinsic binding constants for Langmuir type sorption were greatly affected by the introduction of a trifluoromethyl or methyl group into the dye molecule. On the basis of these results the effects of the substituents are discussed.

Baughman, G.L. (1995), Fate of dyes in aquatic systems. Part 3: The role of suspended sediments in adsorption and reaction of acid and direct dyes. *Dyes and Pigments*, **27** (3), 197-210.

Full Text: [D\Dye Pig27, 197.pdf](D/Dye%20Pig27,%20197.pdf)

Abstract: The behavior of nine acid and five direct dyes was examined in suspensions of lake and river sediments. Seven of the dyes demonstrated variable kinetics of loss from water. In most cases, there was an initial drop in water concentration due to sorption. Transformation kinetics of CI Acid Reds 4, 18 and 88 were first order in dye concentration and apparently first order in sediment concentration. CI Acid Reds 4 and 18 also exhibited an initial lag period. Transformation and sorption of CI Acid Red 114 and CI Acid Red 151 could not be studied because of precipitation. CI Acid Yellow 151, DY 1 and CI Acid Blue 92 were lost from solution by pathways that were not first order. of these, CI Acid Blue 92 was transformed at a rate that was too fast to measure reliably, but CI Acid Yellow 151 and DY 1 were very stable in the suspensions. Products of azo group reduction were found for CI Acid Reds 1 and 4 and CI Direct Red 24. The results suggest that many acid and direct dyes will be stable in aquatic systems for long periods of time unless other transformation pathways (e.g. photochemical) are rate determining. Freundlich adsorption isotherms were measured for 12 of the dyes with both sediments. Because of competitive transformation and sorption, isotherms were measured on boiled sediments after equilibration for 24 h. The data show that the dyes are not strongly sorbed and that the extent of sorption to boiled sediment is within a factor of two to three of that with natural sediment.

Bae, S.H., Motomura, H. and Morita, Z. (1997), Adsorption behavior of reactive dyes on cellulose. *Dyes and Pigments*, **34** (1), 37-55.

Full Text: [D\Dye Pig34, 37.pdf](D/Dye%20Pig34,%2037.pdf)

Abstract: The adsorption of three anionic dyes (CI Reactive Red 120, a monochlorotriazinyl red dye (Red E), and CI Direct Blue I) on cellulose was investigated from a neutral dyebath at 80°C over a wide concentration range of sodium sulfate. Because of the apparent low substantivity, no accurate adsorption was determined at low electrolyte concentrations, where a higher apparent substantivity of the dyes was observed. The standard chemical potential differences between the cellulose and solution phases, or the standard affinity, -Delta mu(0), for these dyes were calculated on the basis of the Donnan equilibrium model. CI Reactive Red 120 and CI Direct Blue I showed saturation in the adsorption isotherm, while Red E had a likeness to the other dyes when a high salt concentration was used. The substantivity of several reactive dye ranges is discussed, comparing them with the present results. (C) 1997 Elsevier Science Ltd.

Timofei, S., Kurunczi, L., Suzuki, T., Fabian, W.M.F. and Mureşan, S. (1997), Multiple Linear Regression (MLR) and Neural Network (NN) calculations of some disazo dye adsorption on cellulose. *Dyes and Pigments*, **34** (3), 181-193.

Full Text: [D\Dye Pig3, 181.pdf](D/Dye%20Pig3,%20181.pdf)

Abstract: Multiple Linear Regression (MLR) analysis and Neural Network (NN) calculations are applied to a series of 21 disazo anionic dyes. Three-dimensional QSAR parameters were derived from the Cartesian coordinates of the dye molecules. Low energy conformations were obtained by molecular mechanics and quantum chemical calculations. Electronic and steric effects in the dye-cellulose binding are present. The proposed MLR models are rough approximations of nonlinear models. Good correlation with the dye affinity from the MLR calculations and a significantly improved fitting of the NN over the MLR models are observed. The model validity was checked for two proposed models derived from different sets of structural parameters by the leave-one-out cross-validation procedure. For the first model, a better validity (‘cross-validated r2’ value, of 0.622) of the NN model is noticed by leaving out one compound (found as outlier) from the training set, in comparison to that of the MLR model obtained for the same set of compounds (q2 = 0.434). The q2 value of a second MLR proposed model is better than that of the corresponding NN model.

Bae, S.H., Motomura, H. and Morita, Z. (1997), Diffusion/adsorption behaviour of reactive dyes in cellulose. *Dyes and Pigment*, **34** (4), 321-340.

Full Text: [D\Dye Pig34, 321.pdf](D/Dye%20Pig34,%20321.pdf)

Abstract: The diffusion/adsorption behaviour in cellulose films of two monochlorotriazinyl (MCT) reactive dyes having high substantivity to cellulose was investigated from the dyebath using a wide concentration range of sodium sulphate at 80°C. Diffusion coefficients for these reactive dyes showed a large concentration dependence at low salt concentration and a smaller dependence with an increase in salt concentration. The concentration dependence of the diffusion coefficient or of the diffusion behaviour for reactive dyes in cellulose was essentially the same as that for direct dyes. From the results obtained the diffusion/adsorption behaviour of reactive dyes in cellulose could be explained by a variable porosity model in the low concentration range of the dyes. In the case of high salt concentration, the diffusion coefficients in cellulose increased with increasing dye concentration at which the saturated adsorption appeared.

Keywords: Diffusion, Adsorption, Reactive Dyes, Cellulose, Diffusion Model, Pore Model

Bae, S.H., Motomura, H. and Morita, Z. (1998), Effect of anionic groups in cellulose on the adsorption of reactive dyes on cellulose. *Dyes and Pigments*, **36** (1), 61-77.

Full Text: [D\Dye Pig36, 61.pdf](D/Dye%20Pig36,%2061.pdf)

Abstract: The adsorption of CI Reactive Red 120 and CI Direct Blue I on cellulose which was reactively-dyed with reactive dyes having six and eight sulfonate groups was examined at 80°C. Above a certain concentration of sodium sulfate, the same saturated adsorption on the dyed cellulose as that of undyed cellulose was observed. When all the dissociated groups were taken into consideration, the values of -Delta mu(0) for the dyed cellulose were equal to that for the undyed cellulose within experimental errors. Thus, it was shown that only the anionic groups on cellulose had effect on the adsorption of anionic dyes on cellulose, whether it was dyed or not. How the adsorption of anionic dyes on cellulose on which the hydroxyl groups of cellulose and the dyes dissociated depended upon pH was examined by simulation. (C) 1997 Elsevier Science Ltd.

Keywords: Adsorption, Reactive Dyes, Cellulose, Anionic Group, Dissociation, Hydroxyl Group, Simultaneous Diffusion

Notes: highly cited

? Slokar, Y.M., and Le Marechal, A.M. (1998), Methods of decoloration of textile wastewaters. *Dyes and Pigments*, **37** (4), 335-356.

Full Text: [1998\Dye Pig37, 335.pdf](1998/Dye%20Pig37,%20335.pdf)

Abstract: A survey of the most widely used and, according to many researchers, the most promising textile wastewaters decoloration methods is presented. Data on decoloration rates of different dye classes, obtained by means of different methods is gathered. Where known, values of the ecological parameter dissolved organic carbon (DOC) are given as well. All of the data is gathered from the results published in the last decade.

Keywords: Wastewaters, Decoloration, Physical Decoloration Processes, Chemical Decoloration Processes, Biodegradation

Wu, Z.W., Li, P., Wang, S.R. and Lin, L. (1998), Study on the relationship between steric effects and performance of some triazinyl reactive dyes. *Dyes and Pigments*, **38** (1-3), 1-10.

Full Text: [D\Dye Pig38, 1.pdf](D/Dye%20Pig38,%201.pdf)

Abstract: A series of model compounds of triazinyl reactive dyes was synthesized. The dihedral angles between the phenyl and triazinyl ring were calculated using PC Model software (Serena Software Co., USA). and the pseudo first order rate constants of hydrolysis were determined by HPLC. The relationship between steric effects and the reactivity of triazinyl reactive dyes are discussed. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Steric Effect, Dihedral Angle, Triazinyl Reactive Dye

Tajima, M., Sugai, M., Matsunaga, K., Yamashita, T., Inoue, H. and Hida, M. (1998), Thermochromism of dyes on silica gel. *Dyes and Pigments*, **39** (2), 97-109.

Full Text: [Dye Pig39, 97](D/Dye%20Pig39,%2097.pdf)

Abstract: 1-Hydroxyanthraquinone derivatives and some pH indicators showed thermochromism on silica gel, based on the shift in the acid-base equilibrium. In a lower temperature range, the degree of acid dissociation of the dyes increased with a rise in temperature, mainly based on the increase in the basic sites on silica gel resulting from the decreasing amount of water adhering on it. In a higher temperature range, on the other hand, the acid dissociation of the dyes with a rise in temperature was promoted by the increase in acidity of the dyes.

Keywords: Thermochromism, 1-Hydroryanthraquinones, pH Indicators, Silica Gel, Dyes

? Arslan, I. and Balcioğlu, I.A. (1999), Degradation of commercial reactive dyestuffs by heterogenous and homogenous advanced oxidation processes: a comparative study. *Dyes and Pigments*, **43** (2), 95-108.

Full Text: [1999\Dye Pig43, 95.pdf](1999/Dye%20Pig43,%2095.pdf)

Abstract: Advanced oxidation of the commercially available reactive dyestuffs Remazol Black B and Remazol Turquoise Blue G 133 in aqueous solution with TiO2-mediated photocatalytic and photoinduced and dark Fenton/Fenton-like reactions has been studied. Initial decolourization rates, effectiveness in removal of UV254 nm, COD as well as TOC were compared and evaluated. It was found that all advanced oxidation systems were capable of completely decolourizing the azo dye Remazol Black in feasible treatment times and at concentrations typically found in dyehouse effluents, whereas COD and TOC removal efficiencies ranged between 77-98% and 51-86%, respectively. Photo-Fenton’s oxidation gave the best decolourization reaction, which proceeded 20 times faster than TiO2-mediated photocatalytic oxidation. Moreover, photocatalytical treatment of Remazol Black followed the empirical Langmuir-Hinshelwood kinetics in the concentration range 25-100 mg/l. However, none of the advanced oxidation systems was effective in the degradation of the copper phthalocyanine dye Remazol Turquoise Blue for which colour and COD removal was mainly attributable to adsorption on the photocatalyst surface or the coagulating effect of iron applied in the homogenous advanced oxidation reactions. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Advanced Oxidation Processes, Aqueous-Solutions, Azo Dyes, Copper, Degradation, Dye Waste-Water, Effectiveness, Effluents, Fenton’s Reagent, Fentons Reagent, Iron, Kinetics, Photo-Fenton Reaction, Photocatalytic Degradation, Photocatalytic Oxidation, Reactive Remazol Dyes, Remazol Black B, Systems, Textile-Industry, TiO2, Treatment

? Baughman, G.L. (2001), Fate of copper in copper-complexed dyes during biological waste treatment III. *Dyes and Pigments*, **48** (3), 179-186.

Full Text: [D\Dye Pig48, 179.pdf](D/Dye%20Pig48,%20179.pdf)

Abstract: Equations describing the equilibria of copper-complexed dyes during activated sludge wastewater treatment are examined in light of recent sorption measurements. Specifically, factors influencing the removal of copper from reactive and direct azo dyes are considered. The results of these calculations are consistent with experimental results which show that: (1) dissolved copper concentrations depend primarily on sorption to biosolids, and (2) sorption does not strongly affect copper removal from dissolved dye. The same equations have been used to show that employing a strong sequestrant (EDTA) in wet processing can greatly increase total dissolved copper concentrations in effluents due to competitive formation of poorly sorbed complexes. The importance of competing reactions and solids concentration is demonstrated both experimentally and mathematically. The derived equations can be used to estimate copper removal efficiency in various wastewater treatment scenarios as a function of solids concentrations and properties of dyes or complexing agents.

Keywords: Dyes, Copper, Wastewater Treatment, Sorption, Metal Complex

Notes: highly cited

Kannan, N. and Sundaram, M.M. (2001), Kinetics and mechanism of removal of Methylene blue by adsorption on various carbons: A comparative study. *Dyes and Pigments*, **51** (1), 25-40.

Full Text: [D\Dye Pig51, 25.pdf](D/Dye%20Pig51,%2025.pdf)

Abstract: The kinetics and mechanism of Methylene blue adsorption on commercial activated carbon (CAC) and indigenously prepared activated carbons from bamboo dust, coconut shell, groundnut shell, rice husk, and straw, have been studied. The effects of various experimental parameters have been investigated using a batch adsorption technique to obtain information on treating effluents from the dye industry. The extent of dye removal increased with decrease in the initial concentration of the dye and particle size of the adsorbent and also increased with increase in contact time, amount of adsorbent used and the initial pH of the solution. Adsorption data were modeled using the Freundlich and Langmuir adsorption isotherms and first order kinetic equations. The kinetics of adsorption were found to be first order with regard to intra-particle diffusion rate. The adsorption capacities of indigenous activated carbons have been compared with that of the commercial activated carbon. The results indicate that such carbons could be employed as low cost alternatives to commercial activated carbon in wastewater treatment for the removal of colour and dyes. (C) 2001 Published by Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Methylene Blue, Activated Carbons-Commercial and Indigenously Prepared, Freundlich and Langmuir Adsorption Isotherms, Kinetics of Adsorption, Intra-Particle Diffusion, Wastewater Treatment-Removal of Dyes, Low-Cost Adsorbents, Dyestuffs, Dyes

Karcher, S., Kornmüller, A. and Jekel, M. (2002), Screening of commercial sorbents for the removal of reactive dyes. *Dyes and Pigments*, **51** (2-3), 111-125.

Full Text: [D\Dye Pig51, 111.pdf](D/Dye%20Pig51,%20111.pdf)

Abstract: Sorption filters could be a relatively simple treatment step to remove reactive dyes from textile wastewater. Activated carbon is already used in some treatment plants (loadings approx. 100 mg g-1), and many non-regenerable products have been tested. This study aimed at identifying suitable sorbents for on-site regeneration. Zeolites, polymeric resins, ion exchangers and granulated ferric hydroxide (GEH) were tested with different reactive dyes (M 600-1500 g mol-1). Zeolites and microporous resins were not suitable due to extremely low sorption capacities. The macroporous resins without functional groups showed moderate maximum loadings (100-400 µmol g-1 or 100-400 mg g-1) but low affinity and were not suitable for large dyes (>1000 g mol-1). loadings on anion exchangers were high but regeneration was difficult for the strong basic type (S6328a, Bayer). The weak basic type (MP62, Bayer) showed the most favorable profile: max. loadings of 200-1200 µmol g-1 (230-900 mg g-1) and complete regeneration using alkaline methanol (10% water). With GEH moderate loadings of about 150 µmol g-1 were achieved. Catalytic oxidative regeneration of GEH is possible using H2O2.

Keywords: Ion Exchange Resins, Polymeric Resins, Ferric Hydroxide, Reactive Dyes, Sorption, Textile Wastewater

Delval, F., Crini, G., Morin, N., Vebrel, J., Bertini, S. and Torri, G. (2002), The sorption of several types of dye on crosslinked polysaccharides derivatives. *Dyes and Pigments*, **53** (1), 79-92.

Full Text: [D\Dye Pig53, 79.pdf](D/Dye%20Pig53,%2079.pdf)

Abstract: Crosslinked polysaccharides containing tertiary amine groups have been used for the recovery of various textile dyes from aqueous solutions. These polymers were prepared by reticulation of starch-enriched flour using epichlorohydrin as a cross linking agent in the presence of NH4OH. The reaction was optimized and the products analyzed by IR and NMR techniques. Several sorption studies are presented, focusing on the nature of the polymer, the structure of dyes, and the concentration. The results show that these polymers exhibit high sorption capacities: the kinetics of sorption are dependent on the presence of amino groups and the variation in the amount of the sorption also depends on the nature of the dye. Physical adsorption in the polymer network and chemical interaction of the solute dyes via ion exchange and hydrogen bonding are both involved in the sorption process. The sorption mechanism is also due to the presence of dye-dye interactions. Experiments with mixtures of textile dyes show that the sorption of a given solute may be increased by the presence of another one.

Keywords: Dyes, Starch Derivatives, Sorbents, Adsorption, Waste Water Treatment, Removal of Dyes

Carrillo, F., Lis, M.J. and Valldeperas, J. (2002), Sorption isotherms and behaviour of direct dyes on lyocell fibres. *Dyes and Pigments*, **53** (2), 129-136.

Full Text: [D\Dye Pig53, 129.pdf](D/Dye%20Pig53,%20129.pdf)

Abstract: Lyocell fibres, new solvent spun cellulosic polymers, have some advantages over conventional viscose fibres: less pollution produced during the manufacturing process and improved mechanical properties in particular high modulus and tenacity when wet. The aim of this work was centred, on the characterisation of the main influencing parameters in the yield of dyeing with the C.I. Direct Blue 1 dye through the study of equilibrium isotherms. In order to establish a quantitative analysis, some known dyeing sorption isotherms: Nernst, Freundlich and Langmuir, were compared to the experimental isotherm obtained. The free internal volume has been calculated for lyocell fibre. Also, the dyeing characteristic thermodynamic magnitudes were determined: standard affinity, entropy and enthalpy. This will allow for comparison between different operational parameters in order to evaluate the whole process of dyeing lyocell fibres with the dye used.

Keywords: Lyocell, Direct Dyes, Dyeing, Equilibrium, Isotherms, Thermodynamics, Affinity

Kongkachuichay, P., Shitangkoon, A. and Chinwongamorn, N. (2002), Thermodynamics of adsorption of laccaic acid on silk. *Dyes and Pigments*, **53** (2), 179-185.

Full Text: [D\Dye Pig53, 179.pdf](D/Dye%20Pig53,%20179.pdf)

Abstract: The hybrid-race silk yarn was dyed till equilibrium with natural lac dye (laccaic acid) and the thermodynamics of dyeing were investigated. The adsorption isotherm obtained was identified to be a Langmuir type. When the temperature increased, the partition ratio and the standard affinity decreased drastically. The values of heat of dyeing and entropy of dyeing were-13.20 kcal/mol and-0.03 kcal/mol/K, respectively. The effect of memecylon used as a mordant on silk dyeing with lac dye was also studied. It revealed that using memecylon promoted the adsorption of laccaic acid on silk and increased the attraction between laccaic acid and silk surfaces.

Keywords: Adsorption Isotherm, Lac Dyeing, Silk Dyeing, Thermodynamics, Memecylon

Notes: highly cited

Namasivayam, C. and Kavitha, D. (2002), Removal of Congo Red from water by adsorption onto activated carbon prepared from coir pith, an agricultural solid waste. *Dyes and Pigments*, **54** (1), 47-58.

Full Text: [D\Dye Pig54, 47.pdf](D/Dye%20Pig54,%2047.pdf)

Abstract: The adsorption of Congo Red by coir pith carbon was carried out by varying the parameters such as agitation time, dye concentration, adsorbent dose, pH and temperature. Equilibrium adsorption data followed both Langmuir and Freundlich isotherms. Adsorption followed second-order rate kinetics. The adsorption capacity was found to be 6.7 mg dye per g of the adsorbent. Acidic pH was favourable for the adsorption of Congo Red. Desorption studies suggest that chemisorption might be the major mode of adsorption. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Aqueous-Solution, Basic-Dyes, Biosorption, Capacity, Coir Pith Carbon, Color Removal, Congo Red, Desorption Studies, Dyestuffs, Equilibrium, Fe(III)/Cr(III) Hydroxide, Isotherms, Kinetics, pH Effect, Pore Diffusion, Reactive Dyes, Slurry, Temperature

Gemeay, A.H. (2003), Kinetics and mechanism of the reduction of some azo-dyes by inorganic oxysulfur compounds. *Dyes and Pigments*, **54** (3), 201-212.

Full Text: [D\Dye Pig54, 201.pdf](D/Dye%20Pig54,%20201.pdf)

Abstract: The kinetics of the reduction of Sunset Yellow (E-110, C.I. 15985), SY, and Ponceau-4R (E-124, C.I. 16255), PR, dyes by dithinoite and bisulfite was studied using stopped-flow and conventional UV/vis spectrophotometer under *pseudo-* first order conditions. The reaction followed a total one and half-order kinetics, first order with respect to dye and half-order with respect to dithionite, while with bisulfite overall second-order kinetics has been revealed. The reduction using dithionite has higher rate constant than bisulfite. With dithionite, PR has higher rate constant compared with SY, while the reverse has been observed with bisulfite. The direct involvement of SO2.- radical in the reduction mechanism has been established. The formation of carbon-4 sulfonate adducts was concluded in the case of using bisulfite. Addition of β-cyclodextrin showed an enhancement in the reduction rate of SY, while no detectable effect was noticed with PR. This increase in the rate constant is attributed to the inclusion of *p-*sulfophenylazo side of SY into β-cyclodextrine cavity. Addition of cationic surfactant, CTAB, retarded the rate for both dyes due to the squeezed of dye molecules in the micellar core. The reaction was found to be an enthalpy controlled. Finally the reduction mechanism was proposed.

Keywords: Dithionite, Bisulfite, Sunset Yellow, Ponceau-4R, Stopped-Flow, Kinetics, Mechanism, β-Cyclodextrin

Guo, Y.P., Yang, S.F., Fu, W.Y., Qi, J.R., Li, R.Z., Wang, Z.C. and Xu, H.D. (2003), Adsorption of malachite green on micro- and mesoporous rice husk-based active carbon. *Dyes and Pigments*, **56** (3), 219-229.

Full Text: [D\Dye Pig56, 219.pdf](D/Dye%20Pig56,%20219.pdf)

Abstract: The adsorption of malachite green (MG) from aqueous medium by rice husk-based porous carbons (RHCs) were studied. The extent of adsorption was studied as a function of pH, contact time, contact temperature, adsorbate concentration, ion strength and adsorbent with different pore structural. The comparison of adsorption of MG on oxidized carbons and their heat-treated derivatives were studied. The results obtained under various experimental conditions were found to follow the Freundlich adsorption isotherm. The adsorption capacity of carbons activated by NaOH-activation was larger than that of carbons activated by KOH-activation, the adsorption of MG on oxidized carbons was decreased and was enhanced after heat-treatment. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Rice Husk, Carbon, Adsorption, Malachite Green, Double-Layer Capacitors, Equilibrium, Removal, Cadmium

Malik, P.K. (2003), Use of activated carbons prepared from sawdust and rice-husk for adsorption of acid dyes: A case study of Acid Yellow 36. *Dyes and Pigments*, **56** (3), 239-249.

Full Text: [D\Dye Pig54, 239.pdf](D/Dye%20Pig54,%20239.pdf)

Abstract: Activated carbons, prepared from low-cost mahogany sawdust and rice husk have been utilized as the adsorbents for the removal of acid dyes from aqueous solution. An acid dye, Acid Yellow 36 has been used as the adsorbate. Results show that a pH value of 3 is favourable for the adsorption of acid dye. The isothermal data could be well described by the Langmuir and Freundlich equations. Kinetic parameters of adsorption such as the Langergren pseudo-first-order constant and the intraparticle diffusion rate constant were determined. For the present adsorption process, intraparticle diffusion of dye molecule within the particle has been identified to be rate limiting. The adsorption capacities of sawdust carbon (SDC) and rice husk carbon (RHC) were found to be 183.8 mg and 86.9 mg per g of the adsorbent respectively. The results indicate that SDC and RHC could be employed as low-cost alternatives to commercial activated carbon in wastewater treatment for the removal of acid dyes.

Keywords: Adsorption, Activated carbon, Isotherms, Acid Yellow 36, Kinetics

? Jesionowski, T., Pokora, M., Tylus, W., Dec, A. and Krysztafkewicz, A. (2003), Effect of N-2-(aminoethyl)-3-aminopropyltrimethoxysilane surface modification and CI Acid Red 18 dye adsorption on the physicochemical properties of silica precipitated in an emulsion route, used as a pigment and a filler in acrylic paints. *Dyes and Pigments*, **57** (1), 29-41.

Full Text: [2003\Dye Pig57, 29.pdf](2003/Dye%20Pig57,%2029.pdf)

Abstract: Studies were performed on the synthesis of spherical silica particles in an emulsion route, and its surface modification using N-2-(aminoethyl)-3-aminopopyltrimethoxysilane. Onto the. aminosilane-treated. silica surface, C.I. Acid Red 18 dye was adsorbed. The ensuing silica and its derivatives were subjected to comprehensive physicochemical and dispersion analysis. Both the size and shape of the particles. were estimated and the surface specific area (BET) and porosity were characterised using adsorption/desorption curves. Moreover, chemical and surface compositions were determined using elemental analysis and XPS. A mechanism was suggested for the interaction betweeen the aminosilane-modified silica and an organic dye. The obtained pigment was tested in an acrylic paint system; the precipitated monodisperse silica was found to exhibit optimum properties as a carrier of organic dye, particularly after modification of the former with aminosilane, thus acting as a valuable filler and pigment in modern paint systems. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Acrylic Paints, Adsorption, Adsorption Of Organic Dye, Aminosilane Surface Modification, Analysis, Chemical, Dispersion, Dye, Dye Adsorption, Elemental Analysis, Interaction, Mechanism, Modification, Organic, Particle Size, Particles, Pigment, Porosity, Precipitated Silica, Properties, Silica, Surface Modification, Surface Morphology, Synthesis, XPS

Otero, M., Rozada, F., Calvo, L.F., García, A.I. and Morán, A. (2003), Elimination of organic water pollutants using adsorbents obtained from sewage sludge. *Dyes and Pigments*, **57** (1), 55-65.

Full Text: [D\Dye Pig57, 55.pdf](D/Dye%20Pig57,%2055.pdf)

Abstract: Sewage sludge valorisation must be the preferred management solution for a residue which minimising does not keep with a desirable improvement on wastewater treatment. This research work deals with the potential application of adsorbents produced from sewage sludge in organic pollutants removal. After chemical activation and pyrolysis treatment, sewage sludge provides materials of great porosity and high surface area. The properties of this type of material was studied by liquid-phase adsorption using crystal violet, indigo carmine and phenol as adsorbates, experiments being performed for two different adsorbent particle sizes. Firstly, single adsorption batch experiments were carried out to obtain kinetic and equilibrium data. The adsorbate’s preferential adsorption was then investigated by studying adsorption from mixed solutions. The sludge-derived activated carbon produced could adsorb the three adsorbates considered with the time required to reach equilibrium and full adsorptive capacity varying between the adsorbates. Crystal violet adsorption has been higher and faster than indigo carmine or phenol. It is proposed that activated carbons made from sewage sludge show promise for the removal of organic pollutants from aqueous streams. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorbents, Chemical Activation, Liquid-Phase Adsorption, Organic Pollutants, Sewage Sludge, Waste

Bhattacharyya, K.G. and Sarma, A. (2003), Adsorption characteristics of the dye, Brilliant Green, on Neem leaf powder. *Dyes and Pigments*, **57** (3), 211-222.

Full Text: [D\Dye Pig57, 211.pdf](D/Dye%20Pig57,%20211.pdf)

Abstract: A novel adsorbent was developed from mature leaves of natural Neem trees for removing dyes from water. The adsorbent, in the form of fine powder, was found to be very effective in removing the dye, Brilliant Green, from aqueous solution. The adsorption process was carried out in a batch process with different concentrations of the aqueous dye solution as well as with different adsorbent doses, at a range of pH values and temperature. The suitability of the adsorbent was tested by fitting the adsorption data with Langmuir and Freundlich isotherms and by computing equilibrium thermodynamic and kinetic parameters, the values of which showed the Neem leaf powder as a promising adsorbent for dyes in aqueous solution.

Keywords: Acid Dyes, Activated Carbon, Adsorbents, Adsorption, Aqueous-Solutions, Beds, Brilliant Green, Colour Removal, Dyestuffs, Equilibrium, Isotherms, Neem Leaf Powder, Removal, Waste-Water

? Pearce, C.I., Lloyd, J.R. and Guthrie, J.T. (2003), The removal of colour from textile wastewater using whole bacterial cells: A review. *Dyes and Pigments*, **58** (3), 179-196.

Full Text: [D\Dye Pig58, 179.pdf](D/Dye%20Pig58,%20179.pdf)

Abstract: The delivery of colour in the form of dyes onto textile fibres is not an efficient process. The degree of efficiency varies, depending on the method of delivery. As a result, most of the wastewater produced by the textile industry is coloured. It is likely that coloured wastewater was a feature of the first practices of textile dyeing. However, treatment to remove this colour was not considered until the early natural dyestuffs were replaced by synthetic dyes, and the persistence of such synthetic dyes in the environment was recognised (Willmott NJ. The use of bacteria-polymer composites for the removal of colour from reactive dye effluents. PhD thesis, UK: University of Leeds, 1997.). Colour pollution in aquatic environments is an escalating problem, despite the fact that there has been substantial research into the modification of the dyeing process to improve the level of affinity/fixation of the dyestuffs onto the substrate. The recalcitrant nature of modern synthetic dyes has led to the imposition of strict environmental regulations. The need for a cost-effective process to remove the colour from wastewater produced by the textile industry has been recognised (Willmott NJ, Guthrie JT, Nelson G. The biotechnology approach to colour removal from textile effluent. JSDC 1998, 1 14(February):38-41.). Several strategies have been investigated. However, the review presented here concerns the use of whole bacterial cells for the reduction of water-soluble dyes present in textile dyeing wastewater. (C) 2003 Elsevier Ltd. All rights reserved.

Keywords: Colour Removal, Textile Wastewaters, Azo Dyes, Whole Bacterial Cells, Reactive Azo Dyes, Sp Strain BN6, Pseudomonas-Luteola, Redox Mediators, Triphenylmethane Dyes, Microbial Decolorization, Anaerobic Reduction, Aerobic Treatment, Activated-Sludge, Orange-II

Chiou, M.S., Ho, P.Y. and Li, H.Y. (2004), Adsorption of anionic dyes in acid solutions using chemically cross-linked chitosan beads. *Dyes and Pigments*, **60** (1), 69-84.

Full Text: [D\Dye Pig60, 69.pdf](D/Dye%20Pig60,%2069.pdf)

Abstract: One kind of adsorbents with high adsorption capacity of anionic dyes was prepared using ionically and chemically cross-linked chitosan beads. A batch system was applied to study the adsorption of four reactive dyes (RB2, RR2, RY2, RY86), three acid dyes (AO12, AR14, AO7) and one direct dye (DR81) from aqueous solutions by the crosslinked chitosan beads. The adsorption capacities had very large values of 1911-2498 (g/kg) at pH 3-4, 30 ºC, which were 3.4-15.0 and 2.7-27.4 times those of the commercial activated carbon and chitin, respectively. The Langmuir and Freundlich adsorption models were applied to describe the equilibrium isotherms. The Langmuir model agreed very well with experimental data (R2 > 0.9893). The kinetics of adsorption, the ADMI color value and decolorization e.- ciency for di.erent initial dye concentrations were evaluated by the pseudo .rst-order and second-order models. The data agreed very well with the pseudo second-order kinetic model. The adsorption capacity increased largely with decreasing solution pH and adsorbent dosage. The free energy changes ΔG0 for adsorption of anionic dyes in acidic solutions at 30 ºC were evaluated. The negative values of ΔG0 indicate overall adsorption processes are spontaneous. # 2003 Elsevier Ltd. All rights reserved.

Keywords: Adsorption Capacity, Anionic Dyes, Cross-Linked Chitosan Beads, Langmuir Isotherm, Pseudo Second-Order Model

Mak, S.Y. and Chen, D.H. (2004), Fast adsorption of Methylene blue on polyacrylic acid-bound iron oxide magnetic nanoparticles. *Dyes and Pigments*, **61** (1), 93-98.

Full Text: [D\Dye Pig61, 93.pdf](D/Dye%20Pig61,%2093.pdf)

Abstract: The adsorption of Methylene blue (MB) from an aqueous solution by polyacrylic acid-bound iron oxide magnetic nanoparticles was studied. It was shown that the novel magnetic nano-adsorbent was quite efficient for the adsorption/desorption of MB. In the aqueous solution of MB at 25 °C, the adsorption data could be fitted by the Langmuir equation with a maximum adsorption amount of 0.199 mg/mg and a Langmuir adsorption equilibrium constant of 10.1 ml/mg. The adsorption capacity increased with the increase in solution pH (2–10) and the adsorption process was endothermic in nature with an enthalpy change (Δ*H*) of 30.9 kJ/mol at 10–40 °C. By using the methanol solution of acetic acid, the adsorbed MB could be desorbed. In addition, it was notable that both the adsorption and desorption of MB were quite fast and could be completed within 2 min due to the absence of internal diffusion resistance.

Keywords: Adsorption, Iron Oxide, Polyacrylic Acid, Methylene Blue, Magnetic Nanoparticles

Garg, V.K., Kumar, R. and Gupta, R. (2004), Removal of malachite green dye from aqueous solution by adsorption using agro-industry waste: A case study of *Prosopis cineraria*. *Dyes and Pigments*, **62** (1), 1-10.

Full Text: [D\Dye Pig62, 1.pdf](D/Dye%20Pig62,%201.pdf)

Abstract: Adsorbents prepared from *Prosopis Cineraria* sawdust––an agro-industry waste––were successfully used to remove the malachite green from an aqueous solution in a batch reactor. The adsorbents included formaldehyde-treated sawdust (PCSD) and sulphuric acid-treated sawdust (PCSDC). The effects of adsorbent surface change, initial pH, initial dye concentration, adsorbent mass and contact time on dye removal have been determined. Similar experiments were carried out with commercially available coconut based carbon (GAC) to evaluate the performance of PCSD and PCSDC. The adsorption efficiency of different adsorbents was in the order GAC>PCSDC>PCSD. Kinetic parameters of adsorption such as the Lagergren pseudo-first-order constant and the intra particle diffusion were determined. An initial pH of the solution in the range 6–10 was favourable for the malachite green removal for both the adsorbents. These experimental studies have indicated that PCSD and PCSDC could be employed as low-cost alternatives in wastewater treatment for the removal of dyes.

Keywords: Sawdust, Adsorption, Batch Mode, Malachite Green, Kinetics

Ozdemir, O., Armagan, B., Turan, M. and Çelik, M.S. (2004), Comparison of the adsorption characteristics of azo-reactive dyes on mezoporous minerals. *Dyes and Pigments*, **62** (1), 49-60.

Full Text: [D\Dye Pig62, 49.pdf](D/Dye%20Pig62,%2049.pdf)

Abstract: Sepiolite and zeolite, highly porous minerals, are becoming widely used as alternative materials in areas where sorptive, catalytic and rheological applications are required. High ion exchange capacity and high surface areas and more importantly their relatively cheap prices make them attractive adsorbents. In this study, the adsorption mechanism of three reactive azo dyes (Reactive Black 5, Red 239 and Yellow 176) by two natural mezoporous minerals has been examined in order to identify the ability of these minerals to remove coloured textile dyes from wastewaters. For this purpose, a series of batch adsorption tests were carried out as a function of solids concentration, time and dye concentration using natural and modified sepiolites and zeolites. The adsorption results indicate that both natural sepiolite and zeolite have limited adsorption capacities of the reactive dyes but are substantially improved upon modifying their surfaces with quaternary amines. The mechanism of adsorption process is elucidated on the basis of experimental data.

Keywords: Sepiolite, Zeolite, Mezoporous Minerals, Reactive Azo Dyes, Adsorption

Andrzejewska, A., Krysztafkiewicz, A. and Jesionowski, T. (2004), Adsorption of organic dyes on the aminosilane modified TiO2 surface. *Dyes and Pigments*, **62** (2), 121-130.

Full Text: [D\Dye Pig62, 121.pdf](D/Dye%20Pig62,%20121.pdf)

Abstract: Studies were performed on modification of the rutile titanium dioxide surface using 3-aminopropyltriethoxysilane and *N*-2-(aminoethyl)-3-aminopropyltrimethoxysilane in various solvents (methanol, toluene, acetone and methanol-water mixture). The modified titanium white was subjected to physicochemical evaluation, aimed at estimating its bulk density, capacity to absorb water, dibutyl phthalate and paraffin oil. Organic dyes were deposited on the surface of the modified titanium white. For the obtained pigments their dispersion, grain morphology, structure of individual particles, particle size distribution, and specific surface area were estimated. In the studies DLS and SEM techniques, and BET method were employed.

Keywords: Acetone, Bulk Density, Capacity, Density, Dispersion, Distribution, Dyes, Dyes Adsorption, Evaluation, Individual Particles, Methanol, Modification, Modification Process, Morphology, Oil, Organic, Paraffin, Particle, Particle Size, Particle Size Distribution, Particles, Pigments, SEM, Size Distribution, Specific Surface Area, Structure, Surface Area, Suspensions, Techniques, TiO2, Titanium, Titanium Dioxide, Toluene, Water

Papić, S., Koprivanac, N., Božić, A.L. and Meteš, A. (2004), Removal of some reactive dyes from synthetic wastewater by combined Al(III) coagulation/carbon adsorption process. *Dyes and Pigments*, **62** (3), 291-298.

Full Text: [D\Dye Pig62, 291.pdf](D/Dye%20Pig62,%20291.pdf)

Abstract: This study was designed to investigate the removal of reactive dyes, C.I. Reactive Red 45 and C.I. Reactive Green 8, from wastewater using a two-step, Al(III) coagulation/activated carbon adsorption method. The effect of pH and coagulant dosage as well as the effects of contact time and a powdered activated carbon dosage on dye removal have been studied. The process was optimized with reasonable consumption of coagulant and quantity of obtained sludge. Coagulation as a main treatment process followed by adsorption achieved almost the total elimination of both dyes from wastewater with significant reduction (90%) of chemical oxygen demand (COD), total organic carbon (TOC) and adsorbable organic halide (AOX). Besides high efficiency of dye removal, the combined treatment process offers many advantages for potential application such as coagulant savings, minimal amount of sludge formation and also a economic feasibility since it does not require high costs for chemicals and equipment.

Keywords: Reactive Dye, Wastewater Treatment, Coagulation, Carbon Adsorption, Ecological Parameters

Garg, V.K., Amita, M., Kumar, R. and Gupta, R. (2004), Basic dye (Methylene blue) removal from simulated wastewater by adsorption using Indian Rosewood sawdust: A timber industry waste. *Dyes and Pigments*, **63** (3), 243-250.

Full Text: [D\Dye Pig63, 243.pdf](D/Dye%20Pig63,%20243.pdf)

Abstract: Dyes are usually present in trace quantities in the treated effluents of many industries. The effectiveness of adsorption for dye removal from wastewaters has made it an ideal alternative to other expensive treatment methods. This study investigates the potential use of Indian Rosewood (*Dalbergia sissoo*) sawdust, pretreated with formaldehyde and sulphuric acid, for the removal of Methylene blue dye from simulated wastewater. The effects of different system variables, viz., adsorbent dosage, initial dye concentration, pH and contact time were studied. The results showed that as the amount of the adsorbent was increased, the percentage of dye removal increased accordingly. Higher adsorption percentages were observed at lower concentrations of Methylene blue. Optimum pH value for dye adsorption was determined as 7.0 for both the adsorbents. Maximum dye was sequestered within 30 min after the beginning for every experiment. The adsorption of Methylene blue followed a first order rate equation and fit the Lagergren equation well. Similar experiments were carried out with commercially available activated carbon to compare the results. Sulphuric acid treated sawdust or formaldehyde treated sawdust of Indian Rosewood can be attractive options for dye removal from dilute industrial effluents.

Keywords: Indian Rosewood, Sawdust, Adsorption, Batch Mode, Methylene Blue, Kinetics

Golob, V. and Ojstršek, A. (2005), Removal of vat and disperse dyes from residual pad liquors. *Dyes and Pigments*, **64** (1), 57-61.

Full Text: [D\Dye Pig64, 57.pdf](D/Dye%20Pig64,%2057.pdf)

Abstract: The efficiency of three wastewater treatment techniques, coagulation/flocculation, adsorption and ultrafiltration, has been studied for the removal of vat and disperse dyes from residual pad liquors. Three inorganic coagulants Al2(SO4)3.18H2O, FeSO4.7H2O, FeCl3.6H2O and commercial cationic flocculant, as individuals and in combination, were tested for the coagulation/flocculation methods. Granular activated carbon was used as an adsorbent in the adsorption technique. Ultrafiltration was performed using a polyethersulfone membrane with a molecular weight cut-off of 10 kDa. Dye removal was evaluated as the difference between concentrations of dyes in pad liquors before and after a particular treatment using absorbance measurements. The obtained results indicated over 90% of dye removal using appropriate coagulants and only 40% using activated carbon. The best results, dye removal over 98%, were achieved using the ultrafiltration technique.

Keywords: Coagulation/Flocculation, Adsorption, Ultrafiltration, Vat Dyes, Disperse Dyes, Decolouration

Kim, T.K., Son, Y.A. and Lim, Y.J. (2005), Affinity of disperse dyes on poly(ethylene terephthalate) in non-aqueous media: Part 1. Adsorption and solubility properties. *Dyes and Pigments*, **64** (1), 73-78.

Full Text: [D\Dye Pig64, 73.pdf](D/Dye%20Pig64,%2073.pdf)

Abstract: Various non-aqueous media were employed to examine the adsorption and solubility properties of disperse dyes on poly(ethylene terephthalate). The dye adsorptions in alkane media were much higher than those in other non-aqueous systems. The adsorption of disperse dyes on poly(ethylene terephthalate) increased with decreasing number of carbon atoms of alkane groups. In the case of relationships between dye adsorption and dye solubility in various non-aqueous media, the adsorption of the dye is linearly and inversely proportional to the dye solubility in the logarithmic plot. The adsorption dependency on the solubility of dyes was shown to have a similar pattern for different disperse dyes.

Keywords: Adsorption, Poly(Ethylene Terephthalate), Disperse Dyes, Non-Aqueous Media, Solubility, Alkane

Kim, T.K. and Son, Y.A. (2005), Effect of reactive anionic agent on dyeing of cellulosic fibers with a Berberine colorant: Part 2: Anionic agent treatment and antimicrobial activity of a Berberine dyeing. *Dyes and Pigments*, **64** (1), 85-89.

Full Text: [D\Dye Pig64, 85.pdf](D/Dye%20Pig64,%2085.pdf)

Abstract: A reactive anionic agent containing dichloro-*s*-triazinyl reactive group was synthesized and applied to the cotton fabric. Berberine as a natural cationic colorant showed considerable substantivity towards anionic agent modified fabric. This Berberine can be also employed in antimicrobial finishes as a natural agent due to its characteristic of cationic quaternary ammonium salt. It was found that the adsorption of Berberine onto cotton fabric pretreated with the anionic agent was greatly increased when compared to that of untreated counterpart. The addition of neutral salts was greatly effective to increase the exhaustion–fixation efficiencies (%EF) of the anionic agent onto the cotton fabric. In terms of antimicrobial activity of Berberine dyeing, the dyed sample with Berberine showed very effective antimicrobial functions showing about 99.5% of bacterial reduction against *Staphylococcus aureus*.

Keywords: Berberine, Cotton, Fastness, Anionic Agent, Antimicrobial Activity

? Han, S.Y. and Yang, Y.Q. (2005), Antimicrobial activity of wool fabric treated with curcumin. *Dyes and Pigments*, **64** (2), 157-161.

Full Text: [D\Dye Pig64, 157.pdf](D/Dye%20Pig64,%20157.pdf)

Abstract: Curcumin, a common natural dye used for fabric and food colorations, was used as an antimicrobial finish due to its bactericidal properties on dyed textiles. A common dyeing process, either batch or continuous, could provide textiles with colour as well as antimicrobial properties. The relationship between the sorption of an interesting natural colorant onto wool and the antimicrobial ability of the dyed wool were investigated. Relations between the bacterial inhibition rate and curcumin concentration, and inhibition rate and *K*/*S* value were developed. Antimicrobial activity of wool fabric finished with curcumin can be predicted without antimicrobial testing based on the developed relationships. Durability of antimicrobial activity to laundering and to light is also discussed.

Keywords: Curcumin, Antimicrobial ability, Antimicrobial finishing, Dye sorption, *K*/*S*, Wool

Gong, R.M., Ding, Y., Li, M., Yang, C., Liu, H.J. and Sun, Y.Z.. (2005), Utilization of powdered peanut hull as biosorbent for removal of anionic dyes from aqueous solution. *Dyes and Pigments*, **64** (3), 187-192.

Full Text: [D\Dye Pig64, 187.pdf](D/Dye%20Pig64,%20187.pdf)

Abstract: An untried, low cost, locally available biosorbent was investigated for its anionic dye removal capacity from aqueous solution. Powder prepared from peanut hull was used for biosorption of three anionic dyes, amaranth (Am), sunset yellow (SY) and fast green FCF (FG). The effects of various experimental parameters (e.g. initial pH and dye concentration, sorbent dosage, particle size, ion strength, contact time) were examined and optimal experimental conditions were decided. At initial pH 2.0, three dyes studied could be removed effectively. The isothermal data for biosorption followed the Langmuir and Freundlich models. The biosorption processes conformed to the pseudo-first-order rate kinetics. The results in this study indicated that powdered peanut hull was an attractive candidate for removing anionic dyes from dye wastewater.

Keywords: Peanut Hull, Removal, Anionic Dye, Amaranth, Sunset Yellow, Fast Green FCF

Chairat, M., Rattanaphani, S., Bremner, J.B. and Rattanaphani, V. (2005), An adsorption and kinetic study of lac dyeing on silk. *Dyes and Pigments*, **64** (3), 231-241.

Full Text: [D\Dye Pig64, 231.pdf](D/Dye%20Pig64,%20231.pdf)

Abstract: Adsorption and kinetic studies of lac dyeing of silk were investigated using, as optimal conditions, a pH of 3.0, a material to liquor ratio (MLR) of 1: 100, an initial dye concentration of 450 mg/L and 60 min contact time. The progress of dye adsorption was monitored at *λ*max 487 nm by visible spectroscopy. The experimental data fitted well to the Langmuir and Freundlich isotherms with a high correlation coefficient (*R2*). The pseudo second-order kinetic model was indicated with the activation energy of 47.5 kJ/mol. It is suggested that the overall rate of lac dye adsorption is likely to be controlled by the chemical process. The values of the enthalpy (Δ*H*#) and entropy of activation (Δ*S*#) were 44.7 kJ/mol and −175.7 J/mol K, respectively. The free energy of activation (Δ*G*#) at 30 °C was 97.9 kJ/mol. The activation parameters with and without erythrolaccin in the lac dye were similar, consistent with erythrolaccin only having a slight effect on the lac dyeing of silk. The free energy (Δ*G*°), enthalpy (Δ*H*°) and entropy (Δ*S*°) terms for the lac dyeing were also determined, and the negative values of Δ*G*° and Δ*H*° obtained indicated that the lac dye adsorption process is a spontaneous and an exothermic one.

Keywords: Lac Dyeing, Thai Lac Dye, Adsorption Isotherm, Kinetic Study, Silk Yarn, Dyeing

Bhattacharyya, K.G. and Sharma, A. (2005), Kinetics and thermodynamics of Methylene Blue adsorption on Neem (*Azadirachta indica*) leaf powder. *Dyes and Pigments*, **65** (1), 51-59.

Full Text: [D\Dye Pig65, 51.pdf](D/Dye%20Pig65,%2051.pdf)

Abstract: The dye, Methylene Blue, was adsorbed on an adsorbent prepared from mature leaves of the Neem tree (*Azadirachta indica*). A batch adsorption study was carried out with variable adsorbate concentration, adsorbent amount, pH, and temperature. Ninety-three percent of the dye could be removed by 2 g of the Neem leaf powder from 1 L of an aqueous solution containing 25 mg of the dye at 300 K. The adsorption followed pseudo first order kinetics with a mean rate constant of 3.73×10−3 min−1 and an intra-particle diffusion rate constant of 6.36×10−2 mg g−1 min−0.5. A possible mechanism of adsorption was suggested on the basis of concurrently operating surface adsorption and pore diffusion. The experimental data yielded excellent fits with Langmuir and Freundlich isotherm equations. The Langmuir monolayer capacity had a mean value of 8.76 mg g−1. The adsorption of the dye was endothermic in nature (Δ*H*: 4.62–16.74 kJ mol−1) and was accompanied by an increase in entropy (Δ*S*: 54.22–90.23 J mol−1 K−1) and a decrease in Gibbs energy (Δ*G*: −10.33 to −13.62 kJ mol−1 in the temperature range of 300–330 K). The results indicated that the dye, Methylene Blue, strongly interacts with a biomass-based adsorbent, the Neem leaf powder.

Keywords: Acid Dyes, Activated Carbon, Adsorbent, Adsorption, Aqueous Solution, Aqueous-Solution, Azadirachta Indica, Batch, Batch Adsorption, Capacity, Color Removal, Concentration, Diffusion, Diffusion Rate, Dye, Dye Adsorption, Dye Removal, Dye Removal, Endothermic, Energy, Entropy, Equations, Experimental, Experimental Data, First Order, First Order Kinetics, Fixed-Bed Adsorption, Freundlich, Freundlich Isotherm, Intraparticle, Intraparticle Diffusion, Isotherm, Kinetics, Langmuir, Langmuir and Freundlich Isotherm, Langmuir Monolayer, Leaf, Leaves, Mechanism, Methylene Blue, Monolayer, Monolayer Capacity, Neem Leaf Powder, Order, pH, Pith, Pore, Pore Diffusion, Powder, Pseudo First Order Kinetics, Pseudo-First-Order, Range, Rate, Rate Constant, Sorption, Surface, Surface Adsorption, Temperature, Thermodynamics, Tree, Value, Waste, Water

Son, Y.A., Lim, H.T., Hong, J.P. and Kim, T.K. (2005), Indigo adsorption properties to polyester fibers of different levels of fineness. *Dyes and Pigments*, **65** (2), 137-143.

Full Text: [D\Dye Pig65, 137.pdf](D/Dye%20Pig65,%20137.pdf)

Abstract: The dyeing behaviors using indigo vat dye on conventional and microfiber polyester and its fastness properties to washing were examined. Acid leuco dyeing technique with acetic, formic and citric acids was considered. The effect of urea addition to improve the dye build-up was also investigated. In addition, repeated multiple washings of indigo dyeings, which were compared to the results of disperse dyeings, were carried out to determine the fastness properties. From the obtained results, it is found that acid leuco form provided a satisfactory dye uptake at different pH ranges and that the improved dye build-up characteristic was achieved by urea addition due to increasing dye solubility and dye penetration within the substrates. The fastness to washing of indigo dyeings was more effective than that of comparable depth of disperse dyeings.

Keywords: Indigo, Polyester, Microfiber, Wash Fastness, Acid Leuco, Urea, Disperse Dyes

Alkan, M., Çelikçapa, S., Demirbaş, Ö. and Doğan, M. (2005), Removal of reactive blue 221 and acid blue 62 anionic dyes from aqueous solutions by sepiolite. *Dyes and Pigments*, **65** (3), 251-259.

Full Text: [D\Dye Pig65, 251.pdf](D/Dye%20Pig65,%20251.pdf)

Abstract: The removal of reactive blue 221 and acid blue 62 anionic dyes onto sepiolite from aqueous solutions has been investigated using parameters such as calcination temperature, pH, ionic strength and temperature. After 200 °C calcination temperature, the specific surface area of sepiolite decreased with increasing calcination temperature. The amount adsorbed of reactive blue 221 and acid blue 62 on sepiolite increased with increasing ionic strength and temperature, and decreasing pH. The sepiolite sample calcinated at 200 °C has a maximum adsorption capacity. However, calcination at higher temperature caused a decrease in the amount adsorbed of dye. It was found that the Freundlich isotherm appears to fit the isotherm data better than the Langmuir isotherm. Furthermore, it can be said that sepiolite has a considerable potential as an adsorbent for dyestuffs in a commercial systems.

Keywords: Sepiolite, Anionic Dyes, Adsorption, Freundlich Isotherm

Kim, T.K. and Son, Y.A. (2005), Synthesis of a novel bridge compound having hetero-bi-functional reactive groups. Part 1: Its adsorption properties. *Dyes and Pigments*, **65** (3), 261-266.

Full Text: [D\Dye Pig65, 261.pdf](D/Dye%20Pig65,%20261.pdf)

Abstract: A novel bridge compound having hetero-bi-functional reactive groups was synthesized. It was designed to contain two different reactive groups such as α,β-dibromopropionylamido and dichloro-s-triazinyl group within the molecular structure. The α,β-dibromopropionylamido group shows considerable reactivity towards amines or amino groups at acidic condition and high temperature. In contrast, the dichloro-s-triazinyl group has reactivity towards hydroxyl groups at alkaline condition and room temperature. In order to examine whether as a bridge the compound could combine dyes containing amino groups with cellulosic substrates, a disperse dye containing amino group was tried to dye the cotton fibers pretreated with the reactive compound. In this context, it was investigated that the synthesized compound was treated by using several experimental conditions such as temperature, pH, neutral salt, treatment time and concentration of the compound. It was also found that the compound of hetero-bi-functional reactive groups showed the feasibility as a bridge agent to combine the cellulosic fibers and the disperse dyes having amino groups.

Keywords: Hetero-Bi-Functional, Bridge, Cellulosics, Disperse Dyes, Amino Groups

Jesionowski, T., Binkowski, S. and Krysztafkiewicz, A. (2005), Adsorption of the selected organic dyes on the functionalized surface of precipitated silica via emulsion route. *Dyes and Pigments*, **65** (3), 267-279.

Full Text: [D\Dye Pig65, 267.pdf](D/Dye%20Pig65,%20267.pdf)

Abstract: Physicochemical analysis was performed on silicas precipitated according to a novel method, in an emulsion system. Substrates for the process involved solutions of sodium metasilicate and sulphuric acid while the organic phase consisted of cyclohexane and non-ionic emulsifiers. The silicas were used to obtain hybrid structures of the formed inorganic pigments. For this purpose, the adsorption of organic dyes on the silica surface was preceded by modification of the surface with silane coupling agent containing amine groups. Specific surface area (BET) and porous structure of the raw silicas were estimated. The silicas and pigments were subjected to studies on surface morphology, zeta potential, particle size and distribution of particle diameters were also established. Effects of modification with the aminosilane were appraised using FTIR and 29Si CP MAS NMR techniques.

Stable pigments were obtained on silica core, the surface of which was modified with *N*-2-(aminoethyl)-3-aminopropyltrimethoxysilane. Particles of the obtained pigment manifested a spherical shape and particle size distribution proved that no agglomerate structures were present. High stability of the obtained pigments proved that the organic dye was chemically bound to the modified silica surface. Mechanisms of inorganic–organic hybrid formation were also suggested.

Keywords: Precipitated Silica, Emulsion, Aminosilane, Organic Dyes Adsorption, Inorganic–Organic Hybrid

Kim, T.K. and Son, Y.A. (2005), Affinity of disperse dyes on poly(ethylene terephthalate) in non-aqueous media. Part 2: Effect of substituents. *Dyes and Pigments*, **66** (1), 19-25.

Full Text: [D\Dye Pig66, 19.pdf](D/Dye%20Pig66,%2019.pdf)

Abstract: Adsorption properties of the 10 kinds of disperse dyes having different substituents were examined using several representative non-aqueous media on to poly(ethylene terephthalate) substrates. The dye adsorption amounts in pentane medium representing alkanes were much higher than those in the other non-aqueous media. In pentane medium, as the hydrophobicity of the dyes resulting from the substituents of dye molecules increased, the solubility of the dyes increased and the corresponding dye adsorption greatly decreased. This finding was coincident with the results from the previous study that the adsorption amount of disperse dyes on to substrates was inversely proportional to the solubility of the dyes. Furthermore, the hydrophobicity and the hydrophilicity of the dyes were discussed in terms of the electric dipole moments which are obtained by a semiempirical method using molecular modeling software.

Keywords: Adsorption, Poly(Ethylene Terephthalate), Disperse Dyes, Non-Aqueous Media, Solubility

Guo, Y.P., Zhao, J.Z., Zhang, H., Yang, S.F., Qi, J.R., Wang, Z.C. and Xu, H.D. (2005), Use of rice husk-based porous carbon for adsorption of Rhodamine B from aqueous solutions. *Dyes and Pigments*, **66** (2), 123-128.

Full Text: [D\Dye Pig66, 123.pdf](D/Dye%20Pig66,%20123.pdf)

Abstract: This paper complements the previous one (adsorption of Malachite Green). Adsorption of Rhodamine B (RB) by rice husk-based porous carbons (RHCs) and commercial carbons from aqueous medium have been studied. Three samples of carbons prepared by NaOH activation, three samples prepared by KOH activation and two samples of commercial carbons have been used. The adsorption isotherms have been determined after modifying the carbon N3 surfaces by oxidation with nitric acid and hydrogen peroxide and after degassing at 800 °C. Three samples of N series have larger capacity for removing RB from solution compared to that of the tested commercial carbons, and the capacity of commercial carbons for RB is larger than K series. The adsorption capacity of RB on oxidation carbons is increased and the adsorption capacities on carbons with heat treatment are larger than that on oxidation. The adsorption mechanisms have been proposed through studying the effect of adsorption conditions. They are complicated and appear attributable to various factors, including pore size distribution and chemical interactions between the RB and the surface functional groups on the carbon surfaces.

Keywords: Rice Husk, Carbon, Adsorption, Rhodamine B

? Gong, R.M., Sun, Y.Z., Chen, J., Liu, H.J. and Yang, C. (2005), Effect of chemical modification on dye adsorption capacity of peanut hull. *Dyes and Pigments*, **67** (3), 175-181.

Full Text: [D\Dye Pig67, 175.pdf](D/Dye%20Pig67,%20175.pdf)

Abstract: In this paper, the roles played by three major functional groups (amino, carboxyl and hydroxyl groups) in the biomass of peanut hull in adsorption of six dyes were investigated. These functional groups in peanut hull were chemically modified individually to determine their contribution to the adsorption of ionic dyes. The dyes used were methylene blue (MB), brilliant cresyl blue (BCB), neutral red (NR), amaranth (Am), sunset yellow (SY) and fast green FCF (FG). It was found that carboxyl group inhibited the adsorption of anionic dyes but it was major functional group in the adsorption of cationic dyes, hydroxyl group was important functional group in the adsorption of all six dyes and the effect of methylation of amino group was not significant on the adsorption of six dyes.

Keywords: Adsorption, Aqueous-Solutions, Aspergillus-Niger, Azo Dyes, Biomass, Biosorption Sites, Capacity, Cationic Dyes, Chemical, Chemical Modification, Dye, Dye Adsorption, Dyes, Effluent, Functional Groups, Hydroxyl, IR Spectrum, Methylation, Methylene Blue, Modification, Palm-Fruit Bunch, Paper, Peanut, Peanut Hull, Removal, Residues, Waste-Water, Wheat-Straw, XRD

? Kumar, K.V., Ramamurthi, V. and Sivanesan, S. (2006), Biosorption of malachite green, a cationic dye onto *Pithophora* sp., a fresh water algae. *Dyes and Pigments*, **69** (1-2), 102-107.

Full Text: [2006\Dye Pig69, 102.pdf](2006/Dye%20Pig69,%20102.pdf)

Abstract: Batch sorption experiments were carried out for the removal of malachite green from its aqueous solution using Pithophora sp., a fresh water algae as biosorbent. Dye uptake was found to increase with contact time and initial malachite green concentration. Equilibrium uptake was found to be pH dependent and maximum uptake was observed at a pH of 6. The effect of algae concentration on equilibrium uptake was also estimated. The equilibrium data tend to fit Freundlich isotherm equation. Kinetic studies showed that the biosorption process follows first order rate kinetics with an average rate constant of 0.9213 min-1. The study confirms that the fresh water algae can be used as biosorbent for the removal of malachite green from its aqueous solution. The biosorption process was found to be surface diffusion controlled with an effective diffusion coefficient of 0.011361 cm2/s. (c) 2005 Elsevier Ltd. All rights reserved.

Keywords: Biosorption, Malachite Green, Cationic Dye, Pithophora sp., Kinetics, Equilibrium, Aqueous-Solutions, Removal, Sorption, Peat, Ions

? Attia, A.A., Rashwan, W.E. and Khedr, S.A. (2006), Capacity of activated carbon in the removal of acid dyes subsequent to its thermal treatment. *Dyes and Pigments*, **69** (3), 128-136.

Full Text: [2006\Dye Pig69, 128.pdf](2006/Dye%20Pig69,%20128.pdf)

Abstract: A commercial activated carbon (Prolabo) was subjected to thermal treatment at 400 and 600 °C for 2 h. Characterization of the parent, and heated products, was carried out by determining the N2/77 K adsorption isotherms, FTIR spectra, acidic/basic sites, and adsorption of iodine, Acid Blue 74 (AB), Acid Red 73 (AR) and Acid Yellow 23 (AY) from aqueous solution. Thermal treatment resulted in some enhancement in the porosity characteristics (specific area and pore volume) particularly in micropores, although insignificant changes appear in the surface chemical properties. Two liquid-phase adsorption models are applied, the Langmuir and Dubinin–Radushkevich linear equations, which showed satisfactory fit to the adsorption data. Evaluated capacity and affinity parameters demonstrated that the uptake of the acid dyes decrease in the order of AB > AR >> AY, which may be ascribed to chemical structure differences in substituents and side chains leading to unavailable accessibility. Heated carbons exhibit a reduction in uptake of AB, and an increase in case of AY and AR dyes. Changes in surface chemical groups, under action of heat probably influence the adsorbate/adsorbent, adsorbate/liquid and adsorbent/liquid relationships leading to the apparent differences.

Keywords: Active Carbon, Thermal Activation, Dye Removal, Adsorption Isotherm

? Lee, J.W., Choi, S.P., Thiruvenkatachari, R., Shim, W.G. and Moon, H. (2006), Evaluation of the performance of adsorption and coagulation processes for the maximum removal of reactive dyes. *Dyes and Pigments*, **69** (3), 196-203.

Full Text: [2006\Dye Pig69, 196.pdf](2006/Dye%20Pig69,%20196.pdf)

Abstract: Physicochemical processes of adsorption and coagulation were systematically evaluated for the removal of reactive dyes (Orange 16 and Black 5) in a laboratory scale experimental setup. The effectiveness of combined processes of adsorption and coagulation for complete removal of dyes was also investigated. The right sequence of operation was identified for the combined treatment system. A coconut-based powdered activated carbon (PAC) was used as an adsorbent and alum chloride was chosen as a coagulant. The results indicated that adsorption capacity of Orange 16 was much higher than that of Black 5. Also, adsorption capacity on PAC was highly dependent on the pH of solution. The dye removal efficiencies for 100 mg l−1 of Black 5 and Orange 16 by coagulation were almost 99% and 80% under the determined optimal conditions for Black 5 (250 mg l−1 coagulant dose and pH 6) and for Orange 16 (350 mg l−1 coagulant dose and pH 6). Coagulation followed by adsorption was found to be more efficient than having adsorption prior to coagulation. There was a significant increase in adsorption capacity of PAC for the combined process where coagulation was carried out prior to adsorption. The combined coagulation–adsorption process has the capability of complete dye removal and thus total decolourization, reduction in coagulant and adsorption amounts and thereby produce less amount of sludge.

Keywords: Coagulation, Adsorption, Reactive Dyes, Combined Treatment System, Aluminium Chloride, Activated Carbon

? Mall, I.D., Srivastava, V.C. and Agarwal, N.K. (2006), Removal of Orange-G and Methyl Violet dyes by adsorption onto bagasse fly ash-kinetic study and equilibrium isotherm analyses. *Dyes and Pigments*, **69** (3), 210-223.

Full Text: [2006\Dye Pig69, 210.pdf](2006/Dye%20Pig69,%20210.pdf)

Abstract: In the study, bagasse fly ash (BFA) (generated as waste material from sugar mill), was used as an adsorbent for the removal of Orange-G (OG), and Methyl Violet (MV), from aqueous solution. Batch studies were performed to address various experimental parameters like pH, contact time, adsorbent dose and initial concentration for the removal of these dyes. Effective pH for OG and MV removal were 4 and 9, respectively. Greater percentage of dye was removed with decrease in the initial concentration of dyes, and increase in amount of adsorbent used. Kinetic study showed that the adsorption of dyes on BFA was a gradual process. Quasi-equilibrium reached in 4 h. Pseudo-first-order, pseudo-second-order, Bangham and intra-particle particle diffusion models were used to fit the experimental data. Pseudo-second-order rate equation was able to provide realistic description of adsorption kinetics. Equilibrium isotherms were analysed by Freundlich, Langmuir, Redlich–Peterson, Dubnin–Radushkevich, and Tempkin isotherm equations using correlation coefficients and five different error functions. Freundlich equation is found to best represent the equilibrium data for OG-BFA system while Redlich–Peterson equation better fits the data for MV-BFA system. Thermodynamic study showed that adsorption of MV on BFA (with a more negative Gibbs free energy value) is more favoured among the dyes studied. BFA which was used without any pretreatment showed high surface area, pore volume and pore size exhibiting its potential to be used as an adsorbent for the removal of OG and MV.

Keywords: Adsorption, Dye Removal, Bagasse Fly Ash, Kinetic Study, Error Analyses

? Adak, A., Bandyopadhyay, M. and Pal, A. (2006), Fixed bed column study for the removal of crystal violet (C. I. Basic Violet 3) dye from aquatic environment by surfactant-modified alumina. *Dyes and Pigments*, **69** (3), 245-251.

Full Text: [2006\Dye Pig69, 245.pdf](2006/Dye%20Pig69,%20245.pdf)

Abstract: The fixed bed column study was undertaken for the removal of crystal violet (CV), also known as Basic Violet 3, a well-known cationic dye from wastewater using surfactant-modified alumina (SMA) as an adsorbing media. The SMA was found to be a very efficient media for the removal of dye from wastewater. The column with 2 cm diameter, different bed heights such as 10, 20 and 30 cm could treat 3.58 l, 7.94 l and 12.51 l, respectively, of CV bearing wastewater with CV concentration 200 mg/l and flow rate 8.5 ml/min. The adsorption bed was exhausted within a very short time (~1.5 h) after the breakthrough occurred. 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. Effect of flow rate and initial concentration was studied. Theoretical breakthrough curve was drawn from the batch isotherm data and was compared with experimental breakthrough curve. 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, Adsorption, Column Study, Breakthrough Curve

? Ravikumar, K., Ramalingam, S., Krishnan, S. and Balu, K. (2006), Application of response surface methodology to optimize the process variables for Reactive Red and Acid Brown dye removal using a novel adsorbent. *Dyes and Pigments*, **70** (1), 18-26.

Full Text: [2006\Dye Pig70, 18.pdf](2006/Dye%20Pig70,%2018.pdf)

Abstract: Decolourization of Verofix Red (Reactive Red 3GL) and Lanasyam brown Grl (Acid Brown 29) from aqueous solution was studied by adsorption technique using a hybrid adsorbent that was prepared by pyrolysing a mixture of carbon and flyash at 1:1 ratio. A 24 full factorial central composite design was successfully employed for experimental design and analysis of the results. The combined effect of pH, temperature, particle size and time on the dye adsorption was investigated and optimized using response surface methodology. The optimum pH, temperature, particle size and time were found to be 10.8, 59.25 °C, 0.0525 mm and 395 min, respectively, for Reactive Red 3GL and those for Acid Brown 29 were 1.4, 27.5 °C, 0.0515 mm and 285 min, respectively. Complete removal (100%) was observed for both the dyes using the hybrid adsorbent.

Keywords: Adsorption, Hybrid Adsorbent, Dye Removal, Response Surface Methodology, Statistical Analysis

? Uzun, İ. (2006), Kinetics of the adsorption of reactive dyes by chitosan. *Dyes and Pigments*, **70** (2), 76-83.

Full Text: [2006\Dye Pig70, 76.pdf](2006/Dye%20Pig70,%2076.pdf)

Abstract: The effect of initial concentration, temperature, and shaking rate on the adsorption of reactive yellow 2 (RY2) and reactive black 5 (RB5) by chitosan (Sigma C 3646) was investigated. Experimental data obtained at different temperatures for the adsorption of each dyestuff by chitosan were applied to pseudo first-order, pseudo second-order and Weber–Morris equations, and the rate constants of first-order adsorption (*k*1), the rate constants of second-order adsorption (*k*2) and pore diffusion rate constants (*k*p) at these temperatures were calculated, respectively. In addition, the adsorption isotherms of each dyestuff by chitosan were also determind at different temperatures.

Keywords: Adsorption, Chitosan, Reactive Dyestuff, Diffusion

? Crini, G. and Peindy, H.N. (2006), Adsorption of C.I. Basic Blue 9 on cyclodextrin-based material containing carboxylic groups. *Dyes and Pigments*, **70** (3), 204-211.

Full Text: [2006\Dye Pig70, 204.pdf](2006/Dye%20Pig70,%20204.pdf)

Abstract: Cyclodextrin-based materials containing carboxylic groups (CD/CMC adsorbents) are used for the removal of C.I. Basic Blue 9 (BB 9) from aqueous solutions. Studies concerning the sorption kinetics (i.e. the effects of contact time, dye concentration and mass of sorbent) are presented and discussed. Results of adsorption experiments showed that these adsorbents exhibited high sorption capacities toward C.I. Basic Blue 9. The adsorption capacity of BB 9 on CD/CMC material increased as the dosage of the material increased and the adsorption kinetics followed a pseudo-second order model. However, the sorption was dependent on the presence of carboxylic groups. Four isotherm equations have been tested in the present study, namely Freundlich, Langmuir, Temkin and generalized. The characteristic parameters for each isotherm have been determined. The monolayer adsorption capacity was 56.5 mg g−1. The Freundlich equation represented the best fit of experimental data than the other isotherm equations.

Keywords: Cyclodextrin, Adsorbent, C.I. Basic Blue 9, Adsorption, Isotherms

? Padmesh, T.V.N., Vijayaraghavan, K., Sekaran, G. and Velan, M. (2006), Biosorption of Acid Blue 15 using fresh water macroalga *Azolla filiculoides*: Batch and column studies. *Dyes and Pigments*, **71** (2), 77-82.

Full Text: [2006\Dye Pig71, 77.pdf](2006/Dye%20Pig71,%2077.pdf)

Abstract: The ability of fresh water macroalga *Azolla filiculoides* to biosorb Acid Blue 15 from aqueous solution was investigated in batch and column studies. Batch experiments were conducted to study the effect of initial solution pH and dye concentration. Langmuir and Freundlich isotherm models were used to fit the equilibrium data. The maximum dye uptake of 116.28 mg/g was observed at pH 7, according to Langmuir model. In column experiments, effects of bed height (15–25 cm), flow rate (5–15 ml/min) and initial dye concentration (50–100 mg/l) on dye removal were studied. An increase in bed height and initial dye concentration favors the dye biosorption, while the minimum flow rate produced maximum dye biosorption. At optimum bed height (25 cm), flow rate (5 ml/min) and initial dye concentration (100 mg/l), A. filiculoides exhibited an uptake of 35.98 mg/g of Acid blue 15. The Bed Depth Service Time model and the Thomas model were used to analyze the column experimental data and the model parameters were evaluated.

Keywords: *Azolla filiculoides*, Effluent Treatment, Acid Dye, Packed Column, Thomas Model

? Özer, A., Akkaya, G. and Turabik, M. (2006), The removal of Acid Red 274 from wastewater: Combined biosorption and biocoagulation with *Spirogyra rhizopus*. *Dyes and Pigments*, **71** (2), 83-89.

Full Text: [2006\Dye Pig71, 83.pdf](2006/Dye%20Pig71,%2083.pdf)

Abstract: In this study, the removal of Acid Red 274 dye by *Spirogyra rhizopus*, a green algae, was studied in a batch mode as a function of the initial pH, temperature, initial dye and algae concentrations. The optimum removal conditions were determined as initial pH 3.0, temperature 30 °C and algae concentration 0.5 g L−1. The dye removal amounts increased linearly with increasing initial AR 274 concentrations and the removal equation at optimum temperature and initial pH value was obtained to be q30 = 0.9724×C0 (R2 = 0.9996). The linear isotherm model was applied to experimental data and was correlated with a linear equation qeq = 18.194×Ceq (R2 = 0.9928) at 30 °C and initial pH 3.0. The removal amounts decreased while the removed concentrations of AR 274 dye increased with increasing S. rhizopus concentration. High AR 274 removal amounts were obtained as a result of the combined biosorption and biocoagulation.

Keywords: *Spirogyra rhizopus*, Acid Red 274, Biosorption, Biocoagulation, Linear Isotherm

? Janhom, S., Watanesk, R., Watanesk, S., Griffiths, P., Arquero, O.A. and Naksata, W. (2006), Comparative study of lac dye adsorption on cotton fibre surface modified by synthetic and natural polymers. *Dyes and Pigments*, **71** (3), 188-193.

Full Text: [2006\Dye Pig71, 188.pdf](2006/Dye%20Pig71,%20188.pdf)

Abstract: Poly(ethyleneimine) (PEI) and bovine serum albumin (BSA) were investigated as pretreating agents for surface modification of the cotton fibres. The measurement of zeta potential was initially used to indicate the effectiveness of the pretreatment. It was found that the PEI largely developed the positive charge whereas the BSA slightly enhanced the positive charge on cotton fibres following a decrease in the pH. Adsorption studies of lac dye on these pretreated cotton fibres show that both PEI and BSA enhance adsorption capacity of lac dye on cotton fibres. The zeta potential results and adsorption studies reveal that the uptake of lac dye on treated cotton fibres occurs via electrostatic attractions between the anion of the dye and cationic segments on the treated cotton fibres. The wash fastness of the dyeing is slightly increased by pretreatment while light fastness is unaffected.

Keywords: Adsorption, Agents, Albumin, Bovine, Bsa, Capacity, Cellulose Fibers, Cotton, Dye, Dyeability, Dyeings, Effectiveness, Improve, LAC Dye, Light, Measurement, Modification, Natural, PEI, pH, Poly(Ethyleneimine), Polymers, Protein, Serum, Surface Modification, Uptake, Zeta Potential

? Rozada, F., Otero, M., García, A.I. and Morán, A. (2007), Application in fixed-bed systems of adsorbents obtained from sewage sludge and discarded tyres. *Dyes and Pigments*, **72** (1), 47-56.

Full Text: [2007\Dye Pig72, 47.pdf](2007/Dye%20Pig72,%2047.pdf)

Abstract: A feasibility study is made with the use of adsorbents produced from sewage sludge and the solid residue of pyrolysed tyres in fixed-bed adsorption. The study was focused on dyeing pollution, and the target dyes were: Methylene blue and Sandolan brilliant red N-BG 125. First, the adsorption isotherms were determined for each adsorbate–adsorbent system and then fixed-bed adsorption was operated, giving characteristic breakthrough curves. The obtained data were fitted to different models in order to determine operational parameters. The results show that, as in the case of the previous discontinuous-regime studies, the most efficient adsorbent was the one derived from the sludge activated with ZnCl2, and that the removal of Sandolan brilliant red N-BG 125 was better than that of Methylene blue. The use of the adsorbent produced from the carbonization of tyres proved not to be feasible in tests of this type owing to its powdery texture.

Keywords: Sewage Sludge, Tyre, Adsorbent, Chemical Activation, Pyrolysis, Liquid-Phase Adsorption, Fixed Bed

? Ravikumar, K., Krishnan, S., Ramalingam, S. and Balu, K. (2007), Optimization of process variables by the application of response surface methodology for dye removal using a novel adsorbent s. *Dyes and Pigments*, **72** (1), 66-74.

Full Text: [2007\Dye Pig72, 66.pdf](2007/Dye%20Pig72,%2066.pdf)

Abstract: Decolourization of Verofix Red (Reactive Red 3GL) and Lanasyam Brown Grl (Acid Brown 29) from aqueous solution was studied by adsorption technique using a hybrid adsorbent that was prepared by pyrolysing a mixture of carbon and flyash in 1:1 ratio. A 24 full factorial central composite design was successfully employed for experimental design and analysis of the results. The combined effect of pH, temperature, particle size and time on the dye adsorption was investigated and optimized using response surface methodology. The optimum pH, temperature, particle size and time were found to be 10.8, 59.25 °C, 0.0525 mm, and 395 min, respectively, for Reactive Red 3GL and those for Acid Brown 29 were 1.4, 27.5 °C, 0.0515 mm and 285 min, respectively. Complete removal (100%) was observed for both the dyes using the hybrid adsorbent.

Keywords: Adsorption, Hybrid Adsorbent, Dye Removal, Response Surface Methodology, Statistical Analysis

? Rattanaphani, S., Chairat, M., Bremner, J.B. and Rattanaphani, V. (2007), An adsorption and thermodynamic study of lac dyeing on cotton pretreated with chitosan. *Dyes and Pigments*, **72** (1), 88-96.

Full Text: [2007\Dye Pig72, 88.pdf](2007/Dye%20Pig72,%2088.pdf)

Abstract: Adsorption and thermodynamic studies of lac dyeing on cotton pretreated with chitosan were investigated under dyeing conditions of pH 3.0, a material to liquor ratio (MLR) of 1:100 and a contact time of 3 h. Batch equilibrium studies showed that the adsorption of lac dye on cotton pretreated with chitosan could be described by the Langmuir isotherm with an enthalpy change (ΔHo) of −17.43 kJ. The pretreatment of cotton with chitosan provided a significant enhancement of dye uptake onto the cotton and also a decrease in the dye desorbed from the cotton compared with the results in the absence of chitosan or on lac dyeing in the presence of NaCl. In addition, sodium chloride had no effect on the adsorption of lac dye on cotton at pH 2.5, 3.0 and 3.5. It indicated that hydrogen ions (H+) play a more important role than sodium ions (Na+) in the dyeing process.

Keywords: Lac Dyeing, Lac Dye, Adsorption, Cotton, Chitosan, Thermodynamics, Desorption

? Kumar, K.V. and Sivanesan, S. (2007), Isotherms for Malachite Green onto rubber wood (*Hevea brasiliensis*) sawdust: Comparison of linear and non-linear methods. *Dyes and Pigments*, **72** (1), 124-129.

Full Text: [2007\Dye Pig72, 124.pdf](2007/Dye%20Pig72,%20124.pdf)

Abstract: Comparison of linear least-squares method and a trial and error non-linear method of estimating the isotherm parameters was examined to the experimental equilibrium data of Malachite Green, a basic dye onto rubber wood sawdust. The experimental data were fitted to Langmuir, Freundlich and Redlich–Peterson isotherms. The four different linearized forms of Langmuir isotherms are also discussed. Langmuir isotherm parameters obtained from the four Langmuir linear equations are different but they are the same by using non-linear Langmuir equation. The best-fitting isotherms are Langmuir and Redlich–Peterson. Present investigation showed that the non-linear method is more appropriate method to determine the isotherm parameters. Langmuir is a special case of Redlich–Peterson when the constant ‘g’ equals to unity.

Keywords: Sorption, Equilibrium, Malachite Green, Rubber Wood Sawdust, Isotherms, Linear Method, Non-Linear Method

? Kumar, K.V. and Sivanesan, S. (2007), Sorption isotherm for safranin onto rice husk: Comparison of linear and non-linear methods. *Dyes and Pigments*, **72** (1), 130-133.

Full Text: [2007\Dye Pig72, 130.pdf](2007/Dye%20Pig72,%20130.pdf)

Abstract: Comparison analysis of linear least-square method and non-linear method for estimating the isotherm parameters was made. Comparison analysis was made using the experimental equilibrium data of safranin onto rice husk at a solution temperature of 305 K. Sorption data were fitted to Freundlich, Langmuir and Redlich–Peterson isotherm equations. All the three isotherm equations showed a better fit to the experimental data. The results show that non-linear method could be a better way to obtain the isotherm parameters. Redlich–Peterson isotherm is a special case of Langmuir isotherm when the Redlich–Peterson isotherm constant g was unity.

Keywords: Sorption, Safranin, Rice Husk, Equilibrium Isotherm, Linear Method, Non-Linear Method

? Ho, Y.S. (2007), Comments on “An adsorption and kinetic study of lac dyeing on silk”. *Dyes and Pigments*, **72** (1), 134-136.

Full Text: [2007\Dye Pig72, 134.pdf](2007/Dye%20Pig72,%20134.pdf), [2005\Dye Pig-Ho.pdf](2005/Dye%20Pig-Ho.pdf), [2005\Dye Pig-Ho1.pdf](2005/Dye%20Pig-Ho1.pdf), [2005\Dye Pig-Ho2.pdf](2005/Dye%20Pig-Ho2.pdf)

? Eren, E. and Afsin, B. (2007), Effect of cation exchanged bentonites (CEBs) on the aggregation of a cresol based dye. *Dyes and Pigments*, **72** (2), 228-232.

Full Text: [2007\Dye Pig72, 228.pdf](2007/Dye%20Pig72,%20228.pdf)

Abstract: The effect of raw and cation exchanged bentonite (CEB) samples on the aggregation of a cresol based dye, bromocresol green, was studied by spectrophotometric method. The changes in the absorption spectra were explained in terms of the layer charge of the clay surfaces which controls the stability of the dye aggregates. (c) 2005 Elsevier Ltd. All rights reserved.

Keywords: Absorption, Absorption Spectra, Adsorption, Aggregates, Aggregation, Bentonite, Bentonites, Bromocresol Green, Cation, Cation Exchanged Bentonite, Changes, Charge, Clay, Dispersions, Dye, J-Aggregate, Layer Charge, Layer Charge-Density, Methylene-Blue, Montmorillonite, pH, Phyllosilicates, Rights, Smectites, Solid Acid Catalyst, Stability, Surfaces

? Kim, T.K., Son, Y.A. and Lim, Y.J. (2007), Thermodynamic analysis of 1,4-diaminoanthraquinone adsorption on polyethylene terephthalate in alkane media. *Dyes and Pigments*, **72** (2), 246-250.

Full Text: [2007\Dye Pig72, 246.pdf](2007/Dye%20Pig72,%20246.pdf)

Abstract: Thermodynamic adsorption parameters of 1,4-diaminoanthraquinone on polyethylene terephthalate (PET) were determined using several alkane media ranging from pentane to decane. In the range from pentane to decane, as the number of carbon atoms in the alkane decreased, the standard affinity (−Δ*μ*0) increased. From the results of the enthalpy change (Δ*H*0) and the entropy change (Δ*S*0), it is found that when adsorbed in the longer chain of alkane medium than in the shorter one, the dye molecules were more strongly embedded within the PET substrate. The diffusion coefficient (*DT*) of the dye decreased and the activation energy (*E*D) increased with increasing number of carbon atoms in the alkane.

Keywords: Thermodynamic Parameters, 1,4-Diaminoanthraquinone, Diffusion, Adsorption, PET, Alkane

? Pavan, F.A., Gushikem, Y., Mazzocato, A.C., Dias, S.L.P. and Lima, E.C. (2007), Statistical design of experiments as a tool for optimizing the batch conditions to methylene blue biosorption on yellow passion fruit and mandarin peels. *Dyes and Pigments*, **72** (2), 256-266.

Full Text: [2007\Dye Pig72, 256.pdf](2007/Dye%20Pig72,%20256.pdf)

Abstract: In order to reduce the total number of experiments for achieving the highest removal of methylene blue (MB) from aqueous solutions using yellow passion fruit peel (*Passiflora edullis, F. flavicarpa*) and mandarin peel (*Citrus reticulata*) as biosorbents two independent sets of full 23 factorial designs with two central points (10 experiments) were experimented. In order to continue the optimization of the system a new full 22 factorial design with two central points (six experiments) and a central composite surface analysis (13 experiments, divided into four cube points, five centre points, and four axial points) were employed for yellow passion fruit peel (PFP) and mandarin peel (MP), respectively. Using these statistical tools, the best conditions for MB removal from aqueous solution were initial methylene blue (*C*0) of 3.20 mg l−1, pH 9.0 for PFP and 11.0 for MP and time of contact higher than 48 h for PFP and 42.9 h for MP.

Keywords: Yellow Passion Fruit Peel, Mandarin Peel, Methylene Blue Removal, Biosorption, Factorial Design, Central Composite Surface Analysis

? Wang, S.B. and Li, H.T. (2007), Kinetic modelling and mechanism of dye adsorption on unburned carbon. *Dyes and Pigments*, **72** (3), 308-314.

Full Text: [2007\Dye Pig72, 308.pdf](2007/Dye%20Pig72,%20308.pdf)

Abstract: Textile dyeing processes are among the most environmentally unfriendly industrial processes by producing coloured wastewaters. The adsorption method using unburned carbon from coal combustion residue was studied for the decolourisation of typical acidic and basic dyes. It was discovered that the unburned carbon showed high adsorption capacity at 1.97×10−4 and 5.27×10−4 mol/g for Basic Violet 3 and Acid Black 1, respectively. The solution pH, particle size and temperature significantly influenced the adsorption capacity. Higher solution pH favoured the adsorption of basic dye while reduced the adsorption of acid dye. The adsorption of dye increased with increasing temperature but decreased with increasing particle size. Sorption kinetic data indicated that the adsorption kinetics followed the pseudo-second-order model. The adsorption mechanism consisted of two processes, external diffusion and intraparticle diffusion, and the external diffusion was the dominating process.

Keywords: Acid, Acid Dye, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Kinetics, Adsorption Mechanism, Aqueous-Solution, Bagasse Fly-Ash, Basic Dye, Basic Dyes, Capacity, Carbon, Combustion, Diffusion, Dye, Dye Adsorption, Dye-Adsorption, Dyes, Elsevier, External Diffusion, Intraparticle Diffusion, Kinetic, Kinetics, Low-Cost Adsorbents, Mechanism, Methylene-Blue, Model, Modelling, pH, Pseudo Second Order, Pseudo-Second-Order, Removal, Sorbents, Sorption, Temperature, Unburned Carbon, Waste-Water, Wastewaters

? Wang, L.Y., Chen, Q.W., Zhai, G.H., Wen, Z.Y. and Zhang, Z.X. (2007), Theoretical study on the structures and absorption properties of styryl dyes with quinoline nucleus. *Dyes and Pigments*, **72** (3), 357-362.

Full Text: [2007\Dye Pig72, 357.pdf](2007/Dye%20Pig72,%20357.pdf)

Abstract: The ground-state geometries, the lowest energy transitions and the electronic spectra for a series of styryl dyes with quinoline nucleus have been studied with TD-DFT including SCRF approach. TD-DFT calculations provide a correct description of the UV–Vis spectra of these dye molecules. Moreover, the π → π\* type absorption bands of unsubstituted or substituted styrylquinolines are all reasonably well reproduced by TD-DFT at the B3LYP/6-311G\*\* level. Compared with our previously reported experimental data, the average relative deviation of *λ*max is −2.56% in gas phase and −2.48% in methanol solvent.

Keywords: Styryl Dyes With Quinoline Nucleus, TD-DFT, SCRF, Transition Energy, UV–Vis Spectrum

? Joo, D.J., Shin, W.S., Choi, J.H., Choi, S.J., Kim, M.C., Han, M.H., Ha, T.W. and Kim, Y.H. (2007), Decolorization of reactive dyes using inorganic coagulants and synthetic polymer. *Dyes and Pigments*, **73** (1), 59-64.

Full Text: [2007\Dye Pig73, 59.pdf](2007/Dye%20Pig73,%2059.pdf)

Abstract: A coagulation/flocculation process was employed for the treatment of high concentration reactive dye wastewater. A polymer flocculant synthesized from cyanoguanidine and formaldehyde under acidic conditions was applied with inorganic coagulant (alum or ferric salt) for the dyeing wastewater. The flocculant was tested for synthetic wastewater containing four model reactive dyes (Black 5, Blue 2, Red 2 and Yellow 2) and real wastewater containing reactive dyes from a local dyeing industry. For the synthetic wastewater, the use of inorganic coagulant (1 g/L) alone achieved only 20% of color removal or less. However, with the aid of polymer flocculant, almost 100% of color removal was obtained. The dye removal efficiency increased as polymer dose increased and the efficiency was affected by solution pH and types of the used inorganic coagulant. The use of inorganic coagulant alone appeared little effective in the removal of reactive dyes from the real wastewater. However, alum/polymer and ferric salt/polymer combinations improved color removal up to 60% and 40%, respectively.

Keywords: Coagulation, Reactive Dyes, Polymer Flocculant, Decoloring, Wastewater

? Dong, Y.C., Chen, J.L., Li, C.H. and Zhu, H.X. (2007), Decoloration of three azo dyes in water by photocatalysis of Fe (III)–oxalate complexes/H2O2 in the presence of inorganic salts. *Dyes and Pigments*, **73** (2), 261-268.

Full Text: [2007\Dye Pig73, 261.pdf](2007/Dye%20Pig73,%20261.pdf)

Abstract: Coloration of textiles is improved by inorganic salts, which increase pollution load on dyehouse effluent in general. In this paper, four inorganic salts including sodium chloride, sodium sulphate, sodium nitrate and potassium chloride were used for investigating their effects on photocatalytic decoloration of three azo dyes, Mordant Black PV, Reactive Blue MS and Direct Sky Blue 5B in water based on Fe (III)–oxalate complexes/H2O2 system in a specially designed photoreactor. Also the photocatalytic degradation and mineralization of the dyes were examined by UV–vis spectrum and TOC measurements. The results indicate that photocatalytic decoloration of the dyes is significantly limited in the presence of salts. Increasing concentration of inorganic salts in water can give rise to reduced decoloration efficiency and kinetic reaction constants of the dyes. Sodium chloride and potassium chloride exhibit stronger inhabiting power on photocatalytic decoloration and degradation than sodium sulphate and sodium nitrate under the same reaction condition.

Keywords: Azo Dyes, Inorganic Salts, Decoloration, Fe (III)–Oxalate Complexes

? Eren, E. (2007), Investigation of a basic dye adsorption from aqueous solution onto raw and pre-treated sepiolite surfaces. *Dyes and Pigments*, **73** (2), 162-167.

Full Text: [2007\Dye Pig73, 162.pdf](2007/Dye%20Pig73,%20162.pdf)

Abstract: The temperature, pH and ionic strength effects on the adsorption of crystal violet (CV) by raw, base activated and Al-saturated sepiolite samples were studied. Al-saturated sepiolite has relatively weak ability for CV adsorption compared to the raw clay, whereas the highest adsorption observed for the base activated sepiolite may be due to the Na+ ions replaced part of Mg2+ located at the edges of the channels. Different thermodynamic parameters for raw and pre-treated sepiolite samples indicate the adsorption of the dye component on a non-uniform surface.

Keywords: Thermodynamics, Cationic Dye, Charge Reversal, Adsorption Isotherm, Crystal Violet, Sepiolite

? Akkaya, G., Uzun, İ. and Güzel, F. (2007), Kinetics of the adsorption of reactive dyes by chitin. *Dyes and Pigments*, **73** (2), 168-177.

Full Text: [2007\Dye Pig73, 168.pdf](2007/Dye%20Pig73,%20168.pdf)

Abstract: The effect of initial concentration, temperature, shaking rate and pH on the adsorption of reactive yellow 2 (RY2) and reactive black 5 (RB5) by chitin (Sigma C 9213) was investigated. Experimental data obtained at different temperatures for the adsorption of each dyestuff by chitin were applied to pseudo first-order, pseudo second-order and Weber–Morris equations, and the rate constants of first-order adsorption (k1), the rate constants of second-order adsorption (k2) and pore diffusion rate constants (kp) at these temperatures were calculated, respectively. In addition, the adsorption isotherms of each dyestuff by chitin were also determined at different temperatures.

Keywords: Adsorption, Chitin, Reactive Dyestuff, Diffusion

? Ardejani, F.D., Badii, K., Limaee, N.Y., Mahmoodi, N.M., Arami, M., Shafaei, S.Z. and Mirhabibi, A.R. (2007), Numerical modelling and laboratory studies on the removal of Direct Red 23 and Direct Red 80 dyes from textile effluents using orange peel, a low-cost adsorbent. *Dyes and Pigments*, **73** (2), 178-185.

Full Text: [2007\Dye Pig73, 178.pdf](2007/Dye%20Pig73,%20178.pdf)

Abstract: Wastewater containing direct dyes discharged from various industries, in particular, textile industry often causes many environmental problems. Considering the possibility of the adsorption process of synthetic dyes and their removal from aqueous solutions using orange peel as an eco-friendly and low-cost adsorbent before discharging to the receiving environment is the most important task. This paper presents a numerical finite element model to simulate the removal of dissolved textile synthetic dyes from wastewater taking into consideration both linear and the Langmuir isotherms to describe adsorption process. The CTRN/W model was integrated with SEEP/W model and modified to solve mathematical equations describing the problem at hand. The modelling accuracy was first verified with an analytical equation for a reactive mass transport problem including advection, dispersion and linear adsorption processes through groundwater flow medium. The modelling results were then compared to those results obtained from experimental tests for the removal of Direct Red 23 and Direct Red 80 dyes from textile wastewater using orange peel adsorbent. The model predictions somewhat agree with the experimental measurements. It was found that the adsorption process by orange peel adsorbent could be well described by the Langmuir isotherm. Furthermore, a pseudo-second order kinetics showed to be well-suited with the rate of sorption. Although the generation of such wastewater by the different industries is nearly unavoidable, the results of model presented here can help to design an appropriate environmental management strategy to minimise the adverse impacts caused by industrial wastewater.

Keywords: Numerical Modeling, Finite Element, Direct Red 23 and 80, Adsorption, Isotherm, SEEP/W, CTRN/W

? Mane, V.S., Mall, I.D. and Srivastava, V.C. (2007), Use of bagasse fly ash as an adsorbent for the removal of brilliant green dye from aqueous solution. *Dyes and Pigments*, **73** (3), 269-278.

Full Text: [2007\Dye Pig73, 269.pdf](2007/Dye%20Pig73,%20269.pdf)

Abstract: The present study deals with the adsorption of brilliant green (BG) on carbon rich bagasse fly ash (BFA). BFA is a solid waste obtained from the particulate collection equipment attached to the flue gas line of the bagasse-fired boilers of cane sugar mills. Batch studies were performed to evaluate the influences of various experimental parameters like initial pH (pH0), contact time, adsorbent dose and initial concentration (C0) on the removal of BG. Optimum conditions for BG removal were found to be pH0 ≈ 3.0, adsorbent dose ≈ 3 g/l of solution and equilibrium time ≈ 5 h. Adsorption of BG followed pseudo-second-order kinetics. Intra-particle diffusion does not seem to control the BG removal process. Equilibrium isotherms for the adsorption of BG on BFA were analyzed by Freundlich, Langmuir, Redlich–Peterson, Dubnin–Radushkevich, and Temkin isotherm models using non-linear regression technique. Redlich–Peterson and Langmuir isotherms were found to best represent the data for BG adsorption onto BFA. Adsorption of BG on BFA is favourably influenced by an increase in the temperature of the operation. Values of the change in entropy (ΔS0) and heat of adsorption (ΔH0) for BG adsorption on BFA were positive. The high negative value of change in Gibbs free energy (ΔG0) indicates the feasible and spontaneous adsorption of BG on BFA.

Keywords: Dye Removal, Bagasse Fly Ash, Adsorption Kinetics, Isotherms, Error Analyses, Adsorption Thermodynamics

? Gong, R.M., Jin, Y.B., Chen, J., Hu, Y. and Sun, J. (2007), Removal of basic dyes from aqueous solution by sorption on phosphoric acid modified rice straw. *Dyes and Pigments*, **73** (3), 332-337.

Full Text: [2007\Dye Pig73, 332.pdf](2007/Dye%20Pig73,%20332.pdf)

Abstract: In this article, rice straw was chemically modified by means of phosphorylation, and then the phosphoric acid modified rice straw was further loaded with sodium ion in order to yield potentially biodegradable cationic sorbent. The feasibility of the modified product as cationic dye sorbent for removing basic dyes from aqueous solution was investigated. Two basic dyes, basic blue 9 (BB9) and basic red 5 (BR5), were used as sorbates. The effects of various experimental parameters (e.g. initial pH, sorbent dosage, dye concentration, ion strength, contact time) were examined and optimal experimental conditions were decided. The BB9 and BR5 removal ratios came up to the maximum value beyond pH 4. The 1.5 g/l or more sorbent could almost completely remove BB9 and BR5 from 250 mg/l of dye solution. The ratios of BB9 and BR5 sorbed were kept above 96% over a range from 50 to 350 mg/l of dye concentration when 2.0 g/l of sorbent was used. Increase in ion strength of solution induced decline of BB9 and BR5 sorption. The isothermal data fitted the Langmuir model. The sorption processes followed the pseudo-first-order rate kinetics. The results in this research confirmed that the phosphoric acid modified rice straw was an excellent basic dye sorbent.

Keywords: Adsorbents, Adsorption, Agricultural By-Products, Basic Blue 9, Basic Dyes, Basic Red 5, Biodegradable, Chemical Modification, Concentration, Crop Residues, Dosage, Dye, Dyes, Effluents, Ion, Kinetics, Metal-Ions, Model, Parameters, Peanut Hull, pH, Phosphoric Acid, Phosphorylation, Range, Research, Rice, Rice Straw, Sodium, Sorbed, Sorption, Waste-Water, Yield

? Lorenc-Grabowska, E. and Gryglewicz, G. (2007), Adsorption characteristics of Congo Red on coal-based mesoporous activated carbon. *Dyes and Pigments*, **74** (1), 34-40.

Full Text: [2007\Dye Pig74, 34.pdf](2007/Dye%20Pig74,%2034.pdf)

Abstract: Adsorption of Congo Red dye (CR) on bituminous coal-based mesoporous activated carbon (AC) from aqueous solutions was studied. The ACs used differed significantly in terms of total surface area, pore volume distribution and surface charge properties. The mesopore contribution to the total pore volume ranged from 52 to 83%. The adsorption tests were performed under static conditions at solution pH 7.8-8.3. The pH at the point of zero charge (pHPZC) for ACs used was over 10. It was found that the higher the fraction of mesopores with a size between 10 and 50 nm, the shorter the time to achieve the equilibrium stage for CR adsorption. 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 CR on mesoporous activated carbon very well. The correlation coefficients ranged from 0.980 to 0.991. The intraparticle diffusion into small mesopores was found to be the rate-limiting step in the adsorption process. The equilibrium adsorption data were interpreted using Langmuir and Freundlich models. The adsorption of CR was better represented by the Langmuir equation. The monolayer adsorption capacity of ACs was found to increase with increasing both the mesopore volume and the mesopore contribution to their porous texture. The effect of solution ionic strength on the uptake of CR by two different mesoporous carbons was also investigated.

Keywords: Congo Red, Adsorption, Activated Carbon, Porous Texture, Kinetics

? Yilmaz, A., Yilmaz, E., Yilmaz, M. and Bartsch, R.A. (2007), Removal of azo dyes from aqueous solutions using calix[4]arene and β-cyclodextrin. *Dyes and Pigments*, **74** (1), 54-59.

Full Text: [2007\Dye Pig74, 54.pdf](2007/Dye%20Pig74,%2054.pdf)

Abstract: A calix[4]arene-based oligomer 5 and a β-cyclodextrin polymer 6 were synthesized by the condensation of *p*-*tert*-butylcalix[4]arene and β-cyclodextrin, respectively, with hexamethylene diisocyanate. In their batch sorption of selected azo dyes, the β-cyclodextrin polymer 6 was found to be a better azo dye sorbent than the *p*-*tert*-butylcalix[4]arene-based oligomer 5. In addition, oligomer 4 containing pendant calix[4]arene units with crown-6 functionalities on the lower rim was synthesized and its complexation of the azo dyes was investigated by liquid–liquid extraction. The calix[4]crown-6 oligomer 4 showed the highest affinity for the azo dyes.

Keywords: β-Cyclodextrin, Calix[4]arene oligomer, Azo dye, Calix[4]crown-6

? Ofomaja, A.E. and Ho, Y.S. (2007), Equilibrium sorption of anionic dye from aqueous solution by palm kernel fibre as sorbent. *Dyes and Pigments*, **74** (1), 60-66.

Full Text: [2007\Dye Pig74, 60.pdf](2007/Dye%20Pig74,%2060.pdf); [2006\Dye Pig-Ofomaja.pdf](2006/Dye%20Pig-Ofomaja.pdf)

Abstract: Palm kernel fibre was investigated for its ability to perform as a suitable sorbent for anionic dye from aqueous solution. The effect of sorbent dose and temperature was investigated using a batch sorption technique. The results revealed the potential of palm kernel fibre, an agricultural waste, as a low-cost sorbent for the anionic dye examined. The isotherm data were closely fitted to the Langmuir equation and the dye sorption capacity of palm kernel fibre increased as the sorbent dose decreased. Maximum saturated monolayer sorption capacity of palm kernel fibre for 4-bromoaniline-azo-1,8-dihydronaphthalene-3,6-disodiumsulphate was 38.6 mg/g. Thermodynamic parameters such as change in the free energy, the enthalpy, and the entropy were also evaluated. In addition, relationships between sorbent dose and Langmuir constants were developed and are presented.

Keywords: Biosorption, Adsorption, Isotherm, Dye, Palm Kernel Fibre, Agricultural Waste

? Bukallah, S.B., Rauf, M.A. and AlAli, S.S. (2007), Removal of Methylene Blue from aqueous solution by adsorption on sand. *Dyes and Pigments*, **74** (1), 85-87.

Full Text: [2007\Dye Pig74, 85.pdf](2007/Dye%20Pig74,%2085.pdf)

Abstract: The removal of Methylene Blue (MB) dye from aqueous solution present as a pollutant material in textile waste water was studied at 298 K in terms of its adsorption behaviour. Local sand sample was used as an adsorbent in this work. The textural properties of the sand including surface area, mean pore radius and total pore volume were examined from the low-temperature adsorption of nitrogen at 77 K. The conditions for maximum adsorption of the dye on sand were optimized. It was seen that under optimized conditions, up to 92% dye could be removed from solution onto the sand surface. The adsorption data were fitted to Freundlich and Dubinin–Raduushkevich equations for the calculation of various adsorption parameters. The Freundlich constants *n* and *A* were determined as 0.9682 and 0.639 mol/g, respectively. The sorption energy calculated by the Dubinin–Raduushkevich equation was found to be 1.22 kJ/mol. The adsorption behaviour of the dye was also investigated in terms of added cations and anions. It was found that the dye adsorption decreased considerably in the presence of thiosulphate, potassium, nickel and zinc ions.

Keywords: Methylene Blue, Adsorption, Sand, Freundlich Isotherm, Dubinin–Raduushkevich Equation

? Sarioglu, M., Bali, U. and Bisgin, T. (2007), The removal of C.I. Basic Red 46 in a mixed methanogenic anaerobic culture. *Dyes and Pigments*, **74** (1), 223-229.

Full Text: [2007\Dye Pig74, 223.pdf](2007/Dye%20Pig74,%20223.pdf)

Abstract: The removal of C.I. Basic Red 46 (BR 46) was investigated with anaerobic mixed culture using glucose (3000 mg l−1 COD) as carbon source and electron donor. Zero-, first- and second-order reaction kinetics were used to find out the suitable substrate removal and decolorization kinetics. The substrate removal (COD) process is suitable for first-order reaction kinetic among the kinetic models studied. Increases in dye concentrations from 0 to 1000 mg l−1 decrease the degradation rate constant (*k*1) values from 0.0083 to 0.0032 h−1 in batch experiments carried out with BR 46. Decolorization process approximates to first-order kinetic at 50, 100 and 250 mg l−1 of BR 46, and to zero-order kinetic at 500, 750, 1000 mg l−1 of BR 46 concentration. Substrate and color removal rates (mg l−1 h−1) were found to be 8.07, 7.78, 7.64, 7.23, 6.39, 5.98, 5.28 and 0.66, 1.37, 3.48, 4.95, 6.30, 5.99, respectively, in all serum bottles throughout incubation period.

Keywords: Dye removal, Anaerobic Mixed Culture, Substrate Removal, Kinetic Constant

? Kavitha, D. and Namasivayam, C. (2007), Recycling coir pith, an agricultural solid waste, for the removal of procion orange from wastewater. *Dyes and Pigments*, **74** (1), 237-248.

Full Text: [2007\Dye Pig74, 237.pdf](2007/Dye%20Pig74,%20237.pdf)

Abstract: Batch adsorption experiments were carried out for the removal of procion orange from its aqueous solution using coir pith carbon. This study examines adsorption kinetic parameters on coir pith carbon. The effect of process parameters like contact time, concentration of dye, temperature and pH on the extent of procion orange adsorption from solution has been investigated. In order to develop an effective and accurate design model for removal of dye, adsorption kinetics and equilibrium data are essential basic requirements. Kinetic study showed that the adsorption of dye on coir pith carbon was a gradual process. Lagergren first-order, second-order, Bangham’s and intra-particle diffusion model were used to fit the experimental data. Results of the kinetic studies show that the adsorption reaction is second-order kinetic model with respect to dye solution concentration. Equilibrium isotherms were analyzed by Langmuir, Freundlich, Dubnin–Radushkevich, and Tempkin isotherms. The adsorption equilibrium data obeyed Langmuir, Dubnin–Radushkevich, and Tempkin isotherms. The adsorption capacity was found to be 2.6 mg/g of carbon. Increase of temperature increased adsorption. Acidic pH was favorable for the adsorption of dye. Studies on pH effect and desorption show that chemisorption seems to play a major role in the adsorption process.

Keywords: Adsorption, Procion Orange, Coir Pith Carbon, Isotherms, Kinetics, Temperature Study

? Janoš, P., Michálek, P. and Turek, L. (2007), Sorption of ionic dyes onto untreated low-rank coal - oxihumolite: A kinetic study. *Dyes and Pigments*, **74** (2), 363-370.

Full Text: [2007\Dye Pig74, 363.pdf](2007/Dye%20Pig74,%20363.pdf)

Abstract: The kinetics of the sorption of basic dyes – Methylene Blue (C.I. Basic Blue 9), Malachite Green (C.I. Basic Green 4), Rhodamine B (C.I. Basic Violet 3), Crystal Violet (C.I. Basic Violet 10) – as well as acid dyes – Egacid Orange (C.I. Acid Orange 7), Egacid Yellow (C.I. Acid Orange 11), Midlon Black (C.I. Acid Black 26) – onto a special kind of naturally weathered and oxidised young brown coal called oxihumolite was investigated in a batch arrangement. Both pseudo-first-order and pseudo-second-order kinetic models were applied successfully to evaluate the kinetic dependencies. The intraparticle diffusion model was used to examine diffusion processes taking place during the dye sorption. It was found that the diffusion rate parameters decreased with increasing dose of the sorbent and with increasing particle sizes of the sorbent, whereas an effect of an agitation mode and intensity was much less pronounced. The diffusion processes were identified as the main mechanisms controlling the rate of the dye sorption onto oxihumolite. Malachite Green exhibited faster kinetics of the sorption in comparison with other dyes. However, this different behaviour may not be explained from differences in such parameters as a molecular weight or a dye structure.

Keywords: Acid Dyes, Activated Carbon, Aqueous-Solution, Basic Dyes, Basic-Dyes, Coal, Diffusion, Dye, Dyes, Heavy-Metals, Humic Acids, Intensity, Intraparticle Diffusion, Kinetic, Kinetic Models, Kinetic Study, Kinetics, Low-Cost Adsorbents, Mechanisms, Methylene-Blue Adsorption, Model, Models, Parameters, Particle, Pseudo-Second-Order, Reactive Dyes, Sorption, Sorption Kinetics, Structure, Textile Waste-Water, Young Brown Coal

? Isa, M.H., Lang, L.S., Asaari, F.A.H., Aziz, H.A., Ramli, N.A. and Dhas, J.P.A. (2007), Low cost removal of disperse dyes from aqueous solution using palm ash. *Dyes and Pigments*, **74** (2), 446-453.

Full Text: [2007\Dye Pig74, 446.pdf](2007/Dye%20Pig74,%20446.pdf)

Abstract: Palm oil and textile industries are important contributors to Malaysia’s economic growth. However, these industries also generate various pollutants of the environment. This research explores the possibility of using a low cost adsorbent i.e. ash produced from palm oil factory, for the removal of dyes from aqueous solution. For the treatment to be truly low cost, not only should the adsorbent be easily and cheaply available in abundance but it should also require minimal or no pre-treatment, for expensive pre-treatment procedures would add to the overall treatment cost. Two commercial dyes i.e. disperse blue and disperse red were used. The study incorporates both batch as well as continuous flow experiments. The effects of different system variables, viz., pH, initial dye concentration and agitation time were studied in the batch tests. Acidic pH was found to favour dye removal. The optimum pH and agitation time for the removal of the two dyes were 2 and 60 min, respectively. Both Langmuir and Freundlich isotherms could be used to describe the adsorption of the dyes, with the former yielding somewhat better fits. The experimental data fitted well to the pseudo-second-order kinetic model with R2 > 0.98 for all concentrations (50–250 mg/l) tested. Column plugging was the main problem encountered due to the fine particle size of the ash. Pelletisation of ash using calcium oxide and calcium sulphate was not successful. For industrial application, pelletisation will have cost implications and may not be recommended. Ash may be better used in its natural form in batch process.

Keywords: Abundance, Adsorbent, Adsorption, Adsorption, Agricultural Solid-Waste, Ash, Calcium, Chitosan Beads, Coir Pith, Colour, Concentration, Concentrations, Congo Red, Cost, Disperse Dyes, Dye, Dye Removal, Dyes, Economic, Effects, Environment, Fine Particle, Flow, Freundlich, Growth, Industrial, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Model, Natural, Oil, Palm Ash, Particle, Particle Size, pH, Pollutants, Pre-Treatment, Pseudo-Second-Order, Removal, Research, Sawdust, Sulphate, Treatment, Wastewaters, Water

? Yan, S.L., Gao, Z.X., Fang, Y.J., Cheng, Y.Y., Zhou, H.Y. and Wang, H.Y. (2007), Characterization and quality assessment of binding properties of malachite green molecularly imprinted polymers prepared by precipitation polymerization in acetonitrile. *Dyes and Pigments*, **74** (3), 572-577.

Full Text: [2007\Dye Pig74, 572.pdf](2007/Dye%20Pig74,%20572.pdf)

Abstract: Molecular imprinting technology was employed to produce one kind of malachite green (MG) molecularly imprinted polymers by precipitation polymerization using MG, methacrylic acid, ethylene glycol dimethacrylate, azobisisobutyronitrile, and acetonitrile as template, functional monomer, cross-linker, initiator and porogen, respectively. The binding properties of MG on imprinted polymers were evaluated in acetonitrile by equilibrium rebinding experiments. Scatchard plot’s analysis revealed that there was one class of binding sites populated in the imprinted polymers with an apparent maximum number of MG (2.33 μmol/g). The specificity and selectivity of the imprinted polymers were investigated by binding analysis using MG and structurally related compounds. The results indicated that the imprinted polymers showed a good selectivity and specificity for MG. So the polymers can be used to separate MG from seafood, water and other matrices. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Molecular Imprinting, Precipitation Polymerization, Malachite Green, Removal, Waste, Recovery

? Kumar, K.V. and Porkodi, K. (2007), Batch adsorber design for different solution volume/adsorbent mass ratios using the experimental equilibrium data with fixed solution volume/adsorbent mass ratio of malachite green onto orange peel. *Dyes and Pigments*, **74** (3), 590-594.

Full Text: [2007\Dye Pig74, 590.pdf](2007/Dye%20Pig74,%20590.pdf)

Abstract: Equilibrium studies were carried out at 305 K for the sorption of malachite green onto orange peel for a fixed operating line condition (solution volume/adsorbent mass ratio or *V*/*M* ratio). The experimental data were fitted to the Freundlich, Langmuir and Redlich–Peterson isotherms by non-linear method. The best fitting isotherm was found to be the Langmuir and Redlich–Peterson isotherm. Redlich–Peterson is a special case of Langmuir isotherm when the constant *g* equals unity. A single stage batch adsorber was designed for different operating line (*V*/*M*) ratios using the Redlich–Peterson isotherm. Equilibrium data were obtained from the Langmuir isotherm at different *V*/*M* ratios using the mass balance equation for the batch adsorber system. A simple linear expression relating the parameters involved in the batch adsorber design was proposed for the studied system.

Keywords: Adsorption, Malachite Green, Orange Peel, Operating Line, Adsorber Design, Isotherms

? Kumar, K.V. (2007), Optimum sorption isotherm by linear and non-linear methods for malachite green onto lemon peel. *Dyes and Pigments*, **74** (3), 595-597.

Full Text: [2007\Dye Pig74, 595.pdf](2007/Dye%20Pig74,%20595.pdf)

Abstract: Equilibrium studies were carried out at 305 K for the sorption of malachite green onto lemon peel. The equilibrium data were fitted to the Freundlich, Langmuir and Redlich–Peterson isotherms by linear and non-linear methods. Non-linear method is a better way to obtain the isotherm parameters. The best fitting isotherm was found to be the Langmuir and Redlich–Peterson isotherm. Redlich Peterson is a special case of Langmuir when the constant g equals unity.

Keywords: Adsorption, Malachite Green, Orange Peel, Operating Line, Adsorber Design, Isotherms

? Lata, H., Garg, V.K. and Gupta, R.K. (2007), Removal of a basic dye from aqueous solution by adsorption using *Parthenium hysterophorus*: An agricultural waste. *Dyes and Pigments*, **74** (3), 653-658.

Full Text: [2007\Dye Pig74, 653.pdf](2007/Dye%20Pig74,%20653.pdf)

Abstract: Adsorbents prepared from Parthenium hysterophorus – unwanted weed – were successfully used to remove methylene blue from an aqueous solution in a batch reactor. The adsorbents included sulphuric acid treated Parthenium (SWC) and phosphoric acid treated Parthenium (PWC). Aqueous solutions of various concentrations (50–250 mg/L) were shaken with certain amount of adsorbent to determine the adsorption capacity on SWC and PWC for methylene blue. The effects of adsorbent surface change, initial pH, initial dye concentration, adsorbent dose and contact time on dye removal have been determined. Similar experiments were carried out with commercially available activated carbon (AC) for comparison. Initial pH of aqueous solution had negligible effect on the adsorption capacity of all the studied adsorbents. Maximum dye was sequestered from the solution within 60–90 min after the beginning of every experiment. At 500 mg/L methylene blue concentration, AC had 1.93 and 3.4 times more adsorption capacity than PWC and SWC, respectively. The adsorption capacity of the studied adsorbents was in the order AC > PWC > SWC. Adsorption follows both Langmuir and Freundlich isotherm models. The results showed that SWC and PWC can be considered as potential adsorbents for methylene blue removal from dilute aqueous solutions.

Keywords: Adsorption, Methylene Blue, Sulphuric Acid, Phosphoric Acid, Parthenium, Sorption Isotherm

? Karadag, D. (2007), Modeling the mechanism, equilibrium and kinetics for the adsorption of Acid Orange 8 onto surfactant-modified clinoptilolite: The application of nonlinear regression analysis. *Dyes and Pigments*, **74** (3), 659-664.

Full Text: [2007\Dye Pig74, 659.pdf](2007/Dye%20Pig74,%20659.pdf)

Abstract: Adsorption of Acid Orange 8 onto surfactant-modified clinoptilolite was studied conducting batch experiment system. Effect of pH, dye concentration and contact time on the adsorption was evaluated. Equilibrium adsorption data were analyzed by Langmuir, Freundlich, Redlich–Peterson and Koble–Corrigan isotherm equations using nonlinear regression analysis. The adsorption was analyzed using pseudo-first-order and pseudo-second-order kinetic models and pseudo-second-order model provided the best correlation of the experimental data. Adsorption process was found to be controlled by both surface and particle diffusions.

Keywords: Adsorption, Analysis, Aqueous-Solutions, Carbons, Chi-Square Test, Clinoptilolite, Concentration, Correlation, Decolorization, Dye, Dye Removal, Equilibrium, Experiment, Freundlich, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Mechanism, Methylene-Blue, Model, Models, Nonlinear Regression, Parameters, Particle, p, Process, Pseudo-Second-Order, Regression Analysis, Removal, Rice-Husk, Sorption, Surface, Textile-Dye, Water

? Chiang, H.L., Lin, K.H., Chen, S.Y., Choa, C.G. and Pan, S.D. (2007), Dye adsorption on biosolid adsorbents and commercially activated carbon. *Dyes and Pigments*, **75** (1), 55-59.

Full Text: [2007\Dye Pig75, 55.pdf](2007/Dye%20Pig75,%2055.pdf)

Abstract: This study reused biosolids to manufacture adsorbents (S500 and S600) and used for Chrysophenine (CH) and Orange II adsorption. In addition, a commercially activated carbon (F820) was selected and used in dye adsorption to enable comparison of the dye adsorption characteristics of biosolid adsorbents and commercially activated carbon. The Boehm titration method allows determination of the oxygen surface functional groups. Results indicated that the distribution of the surface functional groups of the two biosolid adsorbents was similar in spite of the fact that they were pretreated under different pyrolytic temperatures. Only a small amount of quinoid-type group existed on the surface of biosolid adsorbents, but it contributed substantially to the surface functional group on F820. The sequence of BET surface area was S600 (813 m2/g) ≈ F820 (802 m2/g) > S500 (737 m2/g). The commercially activated carbon had a high micropore volume and possessed a significant pore volume increment at the pore diameter < 13 Å (a large pore volume peak in the vicinity of 9 Å). The pore volume of biosolid adsorbents was high in the vicinity of 500 Å (macropore) and 80Å(mesopore). The sequence of CH adsorption capacity was S500 > S600 > F820 at different temperatures, indicating that the biosolid adsorbents were more suitable for CH adsorption than the commercially activated carbon. But for Orange II, the adsorption capacity of biosolid adsorbents was higher than F820 at 10 °C. When the adsorption temperature increases, the mass transfer increases and overcomes the adsorption energy barrier. Therefore, the Orange II molecule could transfer into micropores, and the adsorption capacity of F820 approached that of biosolid adsorbents. Moreover, the adsorption capacity of F820 could be higher than that of biosolid adsorbents at 60 °C.

Keywords: Adsorption, Chrysophenine, Orange II, Biosolid Adsorbent, Activated Carbon

? Barragán, B.E., Costa, C. and Márquez, M.C. (2007), Biodegradation of azo dyes by bacteria inoculated on solid media. *Dyes and Pigments*, **75** (1), 73-81.

Full Text: [2007\Dye Pig75, 73.pdf](2007/Dye%20Pig75,%2073.pdf)

Abstract: Bacteria were inoculated on different solid media to attain biodegradability of an azo dye (Acid Orange 7). Kaolin, bentonite and powdered activated carbon (PAC) were selected to be used with cultures of *Enterobacter*, *Pseudomonas* and *Morganella* sp., as bacteria would be able to degrade several textile dyes. For the solid, to be employed as media, special characteristics are needed with regards to adsorption capacity for concentrating substrate within the cell environment and an adequate particle size and surface texture for assuring bacterial colonization. Only PAC with 0.490 mm particle size shows these characteristics among the solids used and it was colonized by a high number of cells from the three cultures. Dye was degraded following a second-order kinetics. A mechanism for dye degradation is proposed in which anaerobic and aerobic microniches in the PAC particle perform cleavage of the azo bond and oxidation of the amines formed in the same biocatalytic particle.

Keywords: Acid Orange 7, Activated Carbon, Activated-Sludge, Adsorption, Adsorption Capacity, Aerobic, Amines, Anaerobic, Anaerobic Conditions, Azo Dye, Azo Dyes, Bacteria, Bentonite, Biodegradability, Biodegradation, Biofilms, Capacity, Carbon, Cells, Characteristics, Cocultures, Colonization, Degradation, Dye, Dyes, Environment, Granular Sludge, Kinetics, Mechanism, Media, Microbial Decolorization, Organics, Oxidation, PAC, Pact Process, Particle, Particle Size, Powdered Activated Carbon, Pseudomonas, Second Order, Second Order Kinetics, Second-Order Kinetics, Solid Media, Substrate, Surface, Textile, Textile Dyes, Texture, Waste-Water

? Andrzejewska, A., Krysztafkiewicz, A. and Jesionowski, T. (2007), Treatment of textile dye wastewater using modified silica. *Dyes and Pigments*, **75** (1), 116-124.

Full Text: [2007\Dye Pig75, 116.pdf](2007/Dye%20Pig75,%20116.pdf)

Abstract: In this work a ‘carrier’ was selected that would separate an anionic reactive dye from aqueous solution, and would display an intense white colour and a high adsorptive capacity. In this context, a commercial, highly dispersed precipitate, Syloid® 244 silica was employed to remove C.I. Reactive Blue 19. The adsorption resulted in blue pigmentation of the silica carrier; the ensuing pigment was subjected to a comprehensive physicochemical analysis, including particle size, particle size distribution, polydispersity, tendency to form primary and secondary agglomerates and the morphology of the particle surface. It was found that a preliminary surface modification of the silica adsorbent with an NH2-silane compound was necessary. The aminosilane-modified silica could be used as a selective adsorbent in the purification of waste dye solutions; its application secured highly efficient removal of dye from solutions (in most cases over 90% and in some cases even 100%). The silica-carrier product was then used as a pigment within an exterior acrylic paint. Optimum properties were obtained using 5% silane; the ensuing pigment displayed very low polydispersity (0.030), low mean particle diameter (428 nm) and no tendency to form secondary agglomerates.

Keywords: Precipitated Silica, Surface Modification, 3-Aminopropyltriethoxysilane, Adsorption of Organic Dye

? Hsueh, C.L., Lu, Y.W., Hung, C.C., Huang, Y.H. and Chen, C.Y. (2007), Adsorption kinetic, thermodynamic and desorption studies of C.I. Reactive Black 5 on a novel photoassisted Fenton catalyst. *Dyes and Pigments*, **75** (1), 130-135.

Full Text: [2007\Dye Pig75, 130.pdf](2007/Dye%20Pig75,%20130.pdf)

Abstract: An activated alumina-supported iron oxide-composite (denoted as FeAA-25) was utilized successfully as a catalyst for the heterogeneous photoassisted Fenton degradation of the azo dye C.I. Reactive Black 5 (RB5) at a pH of 7.0 in our previous study. In this work, the adsorption and desorption behaviours of RB5 on FeAA-25 were studied. Adsorption thermodynamics of RB5 on FeAA-25 were studied at 288, 303 and 318 K and the thermodynamic parameters, such as equilibrium constant (*K*0), standard free energy changes (Δ*G*0), standard enthalpy change (Δ*H*0) and standard entropy change (Δ*S*0) have been obtained. A pseudo-second-order rate model was employed to describe the kinetic adsorption processes. Additionally, desorption studies revealed that RB5 can be easily removed from FeAA-25 by altering the pH of the solution using NaOH. The mechanism of the RB5 adsorption onto FeAA-25 at neutral pH 7.0 will be established through this study.

Keywords: Adsorption, Adsorption and Desorption, Azo Dye, Catalyst, Degradation, Desorption, Desorption Studies, Dye, Dye Orange-Ii, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Constant, Fenton, Fluidized-Bed Reactor, Free Energy, Heterogeneous, Iron, Iron Oxide, Iron-Oxide, Kinetic, Kinetic Adsorption, Kinetics, Mechanism, Mineralization, Model, Natural Organic-Matter, Oxidation, Parameters, pH, Pseudo Second Order, Pseudo-Second-Order, Rate Model, Reactive Black 5, Removal, Standard, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste-Water

? Lorenc-Grabowska, E. and Gryglewicz, G. (2007), Removal of cyanocobalamine from aqueous solution using mesoporous activated carbon. *Dyes and Pigments*, **75** (1), 136-142.

Full Text: [2007\Dye Pig75, 136.pdf](2007/Dye%20Pig75,%20136.pdf)

Abstract: The adsorption of cyanocobalamine was studied using coal-based mesoporous activated carbon (AC). The ACs tested showed a comparable pore volume, around 0.5 cm3 g−1, but different contribution of mesopores ranging from 0.53 to 0.82 cm3 g−1. The adsorption of cyanocobalamine was carried out in slightly alkaline solution in static conditions. Three kinetic models including a first-order Lagergren model, a pseudo-second-order model, and an intraparticle diffusion model were applied to describe the kinetics and mechanism of adsorption. The adsorption of cyanocobalamine on mesoporous carbons followed the pseudo-second-order model. The diffusion of cyanocobalamine molecule within smaller mesopores was identified to be the rate-limiting step. The analysis of adsorption equilibrium data indicates that the adsorption of cyanocobalamine better fits the Langmuir equation than the Freundlich equation. The Langmuir adsorption capacity of the carbon is strongly related to the degree of mesoporosity development. Among ACs tested, the carbon with the highest mesopore volume and mesopore width of 10–50 nm shows the greater ability to remove cyanocobalamine from aqueous solution. The effect of pore-size distribution on the kinetics and mechanism of adsorption has been discussed.

Keywords: Acid Dyes, Activated Carbon, Adsorption, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Adsorption Equilibrium Data, Analysis, Aqueous Solution, Capacity, Carbon, Coal, Congo-Red, Cyanocobalamine, Degradation, Development, Diffusion, Diffusion Model, Distribution, Equilibrium, Equilibrium Data, First Order, Freundlich, Freundlich Equation, Intraparticle Diffusion, Intraparticle Diffusion Model, Kinetic, Kinetic Models, Kinetics, Kinetics, Lagergren, Langmuir, Langmuir Adsorption, Langmuir Equation, Mechanism, Mesopore, Mesopores, Mesoporous, Methylene-Blue, Model, Models, Molecules, Pore Size, Pore Size Distribution, Pore Volume, Pore-Size Distribution, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Rate Limiting, Rate Limiting Step, Sorption, Static, Textile Effluent

? Hameed, B.H., Ahmad, A.L. and Latiff, K.N.A. (2007), Adsorption of basic dye (methylene blue) onto activated carbon prepared from rattan sawdust. *Dyes and Pigments*, **75** (1), 143-149.

Full Text: [2007\Dye Pig75, 143.pdf](2007/Dye%20Pig75,%20143.pdf)

Abstract: Activated carbon prepared from non-wood forest product waste (rattan sawdust) has been utilized as the adsorbent for the removal of methylene blue dye from an aqueous solution. The experimental data were analyzed by the Langmuir and Freundlich models of adsorption. Equilibrium data fitted well with the Langmuir model with maximum monolayer adsorption capacity of 294.14 mg/g. The dimensionless factor, RL revealed the favorable nature of the isotherm of the dye–activated carbon system. The rates of adsorption were found to conform to the pseudo-second-order kinetics with good correlation. The kinetic parameters of this best-fit model were calculated and the results are discussed.

Keywords: Acid, Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Aqueous Solution, Aqueous-Solution, Basic Dye, Behavior, Capacity, Carbon, Correlation, Dye, Equilibrium, Experimental Data, Forest, Freundlich, Isotherm, Kinetic, Kinetic Parameters, Kinetics, Kinetics, Langmuir, Langmuir Model, Methylene Blue, Methylene Blue Dye, Model, Models, Monolayer, Parameters, Porosity, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Rattan Sawdust, Removal, Rice-Husk, Sawdust, Sorption, Surface-Area, Waste

? Kumar, K.V., Porkodi, K. and Selvaganapathi, A. (2007), Constrain in solving Langmuir-Hinshelwood kinetic expression for the photocatalytic degradation of Auramine O aqueous solutions by ZnO catalyst. *Dyes and Pigments*, **75** (1), 246-249.

Full Text: [2007\Dye Pig75, 246.pdf](2007/Dye%20Pig75,%20246.pdf)

Abstract: Langmuir-Hinshelwood (L-H) and first-order expressions are the most widely used expressions to explain the kinetics of heterogeneous catalytic system. Previously lot of researchers approximated the L-H kinetic expression to first-order expression just to easily obtain the parameters involved in the L-H expression. However, it is inappropriate to alter a kinetic model, which is having definite assumptions behind it without any validation. This study reports the constrain in approximating the L-H kinetic expression to first-order kinetic expression using the experimental kinetic data of photocatalytic degradation of Auramine O aqueous solution in the presence of ZnO catalyst. Further, the present investigation showed that it is not appropriate to approximate the Langmuir-Hinshelwood kinetics to first-order kinetics. In addition, a second-order kinetic model is proposed and is found to well represent the experimental data of Auramine O degradation by ZnO catalyst for the range of initial dye concentration studied.

Keywords: Auramine O, First-Order Kinetics, Langmuir-Hinshelwood Kinetics, Parameter Estimation, Photocatalytic Degradation

? Kumar, K.V. and Rattanaphani, S. (2007), Reply to ‘Comments on “An adsorption and kinetic study of lac dyeing on silk”‘ by Yuh-Shan Ho: Discussion on pseudo second order kinetic expression. *Dyes and Pigments*, **75** (1), 253-254.

Full Text: [2007\Dye Pig75, 253.pdf](2007/Dye%20Pig75,%20253.pdf)

Keywords: Adsorption, Dyeing, Kinetic, Kinetic Study, Lac Dyeing, Order, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo-Second-Order, Second Order, Sorption Isotherm

? Ahmad, A.L., Loh, M.M. and Aziz, J.A. (2007), Preparation and characterization of activated carbon from oil palm wood and its evaluation on Methylene blue adsorption. *Dyes and Pigments*, **75** (2), 263-272.

Full Text: [2007\Dye Pig75, 263.pdf](2007/Dye%20Pig75,%20263.pdf)

Abstract: Activated carbons were prepared from the biomass of oil palm wood (OPW) via two stages, pyrolysis and physical activation, using an environmentally friendly pyrolysis pilot plant, and an activation pilot plant was studied. The latter uses the outlet flue gases from limestone calcination process as activating agents. Experimental results showed that pyrolysis and activation conditions leading to various final average temperatures had significant effect on the properties of activated carbons prepared. Suitable pyrolysis operating conditions of 7 m3 h−1 airflow rate for 4 h until final average pyrolysis temperature 390 °C and activation conditions of 7.45 kg limestone calcined with airflow rate 202.4 ml s−1 for 3.5 h until final average activation temperature of 806 °C produced an activated carbon yield of 13.7%, 68.3% fixed carbon, 16.9% volatile matters, 4.3% ash, and 10.6% moisture, and 1084 m2 g−1 BET surface area, and a micropore surface area of 931.6 m2 g−1 was obtained. Methylene blue adsorption was tested and 90.9 mg g−1 maximum adsorption capacity was found. The high micropore fraction, N2 adsorption isotherm and SEM showed that these activated carbons possessed intricate pore network comprising micropores and narrow mesopores. FTIR characterization indicated that pyrolysis and activation temperatures affected the surface functional groups and maximum Methylene blue adsorption was dependent on BET surface area.

Keywords: Activated Carbon, Methylene Blue, Pyrolysis, Activation, BET Surface areas, Langmuir Isotherm

? Wang, S.B. and Zhu, Z.H. (2007), Effects of acidic treatment of activated carbons on dye adsorption. *Dyes and Pigments*, **75** (2), 306-314.

Full Text: [2007\Dye Pig75, 306.pdf](2007/Dye%20Pig75,%20306.pdf)

Abstract: The effect of acidic treatments of activated carbons on dye adsorption was investigated. The physico-chemical properties of activated carbons were characterised by N2 adsorption, mass titration, temperature-programmed desorption (TPD), and X-ray photoelectron spectrometry (XPS). It was found that surface chemistry plays an important role in dye adsorption. HNO3 treatment produces more active acidic surface groups such as carboxyl and lactone, resulting in a reduction in the adsorption of basic dyes. However, HCl treatment decreases active acidic groups and thus enhances the adsorption of larger molecules on activated carbons. For methylene blue, the adsorption shows an order of AC > AC-HCl > AC-HNO3 while for crystal violet and rhodamine B, the adsorption order is AC-HCl > AC > AC-HNO3. It was also found that solution pH shows a significant influence on adsorption of methylene blue but little effect on rhodamine B. Kinetic studies indicate that the adsorption of dyes follows the pseudo-second-order model and the adsorption is an endothermic process.

Keywords: Acid Treatment, Activated Carbon, Activated Carbons, Adsorption, Basic Dyes, Carboxyl, Crystal Violet, Desorption, Dye, Dye Adsorption, Dyes, Endothermic, Groups, Hcl, HNO3, Methylene Blue, Methylene-Blue, Model, N2, N2 Adsorption, N2-Adsorption, N2, Order, pH, Physico-Chemical, Physico-Chemical Properties, Physicochemical Properties, Pore Structure, Process, Properties, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Reduction, Removal, Rhodamine B, Rhodamine-B, Role, Solution pH, Sorption, Spectrometry, Surface, Surface Chemistry, Surface-Chemistry, Temperature Programmed Desorption, Titration, TPD, Treatment, XPS

? Alhassani, H.A., Rauf, M.A. and Ashraf, S.S. (2007), Efficient microbial degradation of Toluidine Blue dye by *Brevibacillus* sp. *Dyes and Pigments*, **75** (2), 395-400.

Full Text: [2007\Dye Pig75, 395.pdf](2007/Dye%20Pig75,%20395.pdf)

Abstract: Economical and bio-friendly approaches are needed to degrade dye-contaminated wastewater from various industries. In this study, we report on the isolation and characterization of a strain of *Brevibacillus* that can efficiently degrade Toluidine Blue dye (TB). Eight different bacterial strains which were initially isolated from soil contaminated with Coomassie Brilliant Blue dye (CBB) showed varying degradation rates for CBB. The most efficient isolate was further tested on 7 other dyes; surprisingly, we found this isolate to be much more efficient in degrading TB. Morphological and enzymatic analyses, as well as 16S rRNA sequencing were used to identify this isolate as a species of *Brevibacillus*. We have characterized the efficiency of TB degradation by this isolate as a function of dye concentration, pH, aeration, as well as nitrogen source. Under optimum conditions, most of the TB could be degraded within 24 h. The biodegradation data for TB were fitted to first-order equation with good correlation.

Keywords: Toluidine Blue, Coomassie Blue, Microbial Degradation, *Brevibacillus*

? Gül, Ş., Özcan, Ö. and Erbatur, O. (2007), Ozonation of C.I. Reactive Red 194 and C.I. Reactive Yellow 145 in aqueous solution in the presence of granular activated carbon. *Dyes and Pigments*, **75** (2), 426-431.

Full Text: [2007\Dye Pig75, 426.pdf](2007/Dye%20Pig75,%20426.pdf)

Abstract: The purpose of this study was to investigate the catalytic role of granular activated carbon (GAC) on the degradation and mineralization of two reactive azo dyes (C.I. Reactive Red 194 (RR194) and C.I. Reactive Yellow 145 (RY145) in aqueous solution by treatment with ozone. Decolourization of the aqueous solution, disappearance of the parent compound, COD and TOC removal were the main parameters investigated for this purpose. Formation of inorganic ions Cl−, SO42−, NH4+, NO3− and pH changes were also followed throughout ozonation of various systems. It was determined that ozone by itself is strong enough to decolorize these aqueous solutions contaminated by azo dyes and almost all COD disappeared by these treatments but efficient mineralization had not been achieved. The extent of TOC removal was about 25% when no granular activated carbon (GAC) had been used and this value was doubled in the presence of GAC. While the reactive hydroxyl radicals were formed on the surface of GAC, it was deduced that the main reactions of the organic species with these reactive radicals took place in the bulk of the solution. One other observation was that the mass ratio of GAC to organic substrate in the aqueous solution should have an optimum value for effective degradation of the organic substrates; excess GAC inhibits degradation reactions probably due to the adsorption of the organic species on the surface of GAC.

Keywords: Catalytic Ozonation, Granular Activated Carbon, Azo Dyes, C.I. Reactive Red 194, C.I. Reactive Yellow 145

? Sarioglu, M. and Bisgin, T. (2007), Removal of Maxilon Yellow GL in a mixed methanogenic anaerobic culture. *Dyes and Pigments*, **75** (3), 544-549.

Full Text: [2007\Dye Pig75, 544.pdf](2007/Dye%20Pig75,%20544.pdf)

Abstract: Degradation of dye Maxilon Yellow GL (MY GL) (Basic Yellow 45) was investigated with anaerobic mixed culture using glucose (3000 mg 1-1 COD) as carbon source and electron donor throughout batch experiments. Zero-, first- and second-order reaction kinetics were used to find out the suitable substrate removal and decolorization kinetics. The substrate removal (COD) process is suitable for second-order reaction kinetics among the kinetic models studied. Decolorization process also approximates to second-order kinetics between 50 and 1000 mg 1-1 of MY GL concentration. Substrate and color removal rates (mg 1-1 h-1) were found to be 6.38, 5.98, 4.6, 4.16, 3.64, 2.86, 2.34 and 0.075, 0.0149, 0.0265, 0.0303, 0.0426, 0.053, respectively, in all serum bottles throughout the incubation period. Color removal efficiencies decreased as the influent dye concentration increased. The highest removal efficiency (80%) was obtained with 50 and 100 mg 1-1 of MY GL dye concentrations. However, the lowest removal efficiency (28%) was found with a 1000 mg 1-1 of MY GL dye concentration. Complete dye reduction was not found for this basic dye. The results indicate that anaerobic mixed culture can decolorize low concentration of this basic dye. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Anaerobic, Anaerobic Mixed Culture, Azo-Dye, Basic Dye, Batch, Batch Experiments, Biosorption, Carbon, Carbon Source, Cod, Color, Color Removal, Concentration, Concentrations, Culture, Decolorization, Dye, Dye Removal, Efficiency, Glucose, Incubation, Influent, Inhibition, Kinetic, Kinetic Constant, Kinetic Models, Kinetics, Low, Methanogenic, Methylene-Blue, Models, Process, Reaction, Reaction Kinetics, Reduction, Removal, Removal Efficiency, Second Order, Second Order Kinetics, Second-Order Kinetics, Serum, Source, Substrate, Substrate Removal, Waste-Water

? Doğan, M., Özdemir, Y. and Alkan, M. (2007), Adsorption kinetics and mechanism of cationic methyl violet and methylene blue dyes onto sepiolite. *Dyes and Pigments*, **75** (3), 701-713.

Full Text: [2007\Dye Pig75, 701.pdf](2007/Dye%20Pig75,%20701.pdf)

Abstract: The use of low-cost and ecofriendly adsorbents was investigated as an ideal alternative to the current expensive methods of removing dyes from wastewater. Sepiolite was used as an adsorbent for the removal of methyl violet (MV) and methylene blue (MB) from aqueous solutions. The rate of adsorption was investigated under various parameters such as contact time, stirring speed, ionic strength, pH and temperature for the removal of these dyes. Kinetic study showed that the adsorption of dyes on sepiolite was a gradual process. Quasi-equilibrium reached within 3 h. Adsorption rate increased with the increase in ionic strength, pH and temperature. Pseudo-first-order, the Elvoich equation, pseudo-second-order, mass transfer and intra-particle diffusion models were used to fit the experimental data. The sorption kinetics of MV and MB onto sepiolite was described by the pseudo-second-order kinetic equation. Intra-particle diffusion process was identified as the main mechanism controlling the rate of the dye sorption. The diffusion coefficient, D, was found to increase when the ionic strength, pH and temperature were raised. Thermodynamic activation parameters such as ΔG°, ΔS° and ΔH° were also calculated. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Activation, Activation Parameters, Adsorbent, Adsorbents, Adsorption, Adsorption Kinetics, Aqueous Solutions, Aqueous-Solution, Basic-Dyes, Coir Pith, Contact Time, Current, Diffusion, Diffusion Coefficient, Diffusion Models, Diffusion-Model, Dye, Dyes, Experimental, Experimental Data, External Mass-Transfer, Fly-Ash, Ideal, Intra Particle Diffusion, Intra-Particle Diffusion, Intraparticle Diffusion, Ionic Strength, Kinetic, Kinetics, Linked Chitosan Beads, Mass Transfer, Mass-Transfer, MB, Mechanism, Methods, Methyl Violet, Methylene Blue, Model-Calculations, Models, Parameters, pH, Pore Diffusion, Process, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo-Second-Order, Rate, Removal, Sepiolite, Solutions, Sorption, Sorption Kinetics, Speed, Strength, Temperature, Time, Transfer, Wastewater

? Pavan, F.A., Dias, S.L.P., Lima, E.C. and Benvenutti, E.V. (2008), Removal of Congo red from aqueous solution by anilinepropylsilica xerogel. *Dyes and Pigments*, **76** (1), 64-69.

Full Text: [2008\Dye Pig76, 64.pdf](2008/Dye%20Pig76,%2064.pdf); [2008\Dye Pig76, 64-1.pdf](2008/Dye%20Pig76,%2064-1.pdf)

Abstract: The hybrid anilinepropylsilica xerogel (SiAn) was synthesized by sol–gel method and it was used as adsorbent for removing Congo red from aqueous solutions. The dye adsorption experiments were carried out by using bath procedure. The pH effects, the contact time and the initial dye concentration were changed to obtain the best experimental conditions. The dye adsorption equilibrium was rapidly attained after 20 min of contact time. The experimental data were best fitted to Sips and Redlich–Peterson isotherm models, attaining a maximum adsorption capacity of 22.62 mg g−1 of Congo red.

Keywords: Congo Red, Dye Adsorption, Hybrid Organic–Inorganic Xerogels, Silica Based Materials, Isotherm Models

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Full Text: [2008\Dye Pig76, 220.pdf](2008/Dye%20Pig76,%20220.pdf)

Abstract: The effects of temperature, pH and ionic strength on the adsorption of crystal violet (CV+) by raw, Ni-saturated (Ni-), Co-saturated (Co-) and Zn-saturated (Zn-) bentonite samples were investigated. The amounts of CV+ adsorbed in equilibrium at 298.15 K were 0.27, 0.37, 0.49 and 0.54 mmol g-1 bentonite, which correspond to 108%, 148%, 196% and 216% of the cation exchange capacity (CEC) of the raw, Ni-, Zn- and Co-saturated bentonite samples, respectively. The adsorption of the dye on these samples is pH-independent within the range (2.5-8.5), and it increases with ionic strength from 0 to 0.6 mol l-1. Thermodynamic and Langmuir parameters showed that cation -saturated bentonite samples have relatively stronger ability than the raw bentonite towards the crystal violet (CV+) cation. (C) 2006 Elsevier Ltd. All rights reserved.

Keywords: Metal-Saturated Bentonite, Adsorption Thermodynamics, Charge Reversal, Crystal Violet, Ionic Strength, Methylene-Blue, Clay-Minerals, Crystal Violet, Competitive Adsorption, Exchangeable Cations, Organic Cations, Pore Structure, Metal-Ions, Montmorillonite, Sorption

? Attia, A.A., Girgis, B.S. and Fathy, N.A. (2008), Removal of Methylene blue by carbons derived from peach stones by H3PO4 activation: Batch and column studies. *Dyes and Pigments*, **76** (1), 282-289.

Full Text: [2008\Dye Pig76, 282.pdf](2008/Dye%20Pig76,%20282.pdf)

Abstract: Several activated carbons were obtained by H3PO4 at 500°C, under increasing acid concentrations of 30-70%. Products were characterized by N2 at 77 K, and proved to be highly microporous with high surface area and pore volume that increased with impregnation ratio. Two modified carbons were prepared by concurrently passing N2 during pyrolysis of impregnated precursor with 50% H3PO4 at 500°C, and post-heat treatment at 800 degrees C for one carbon. A low reduction in porosity accompanied this treatment. Equilibrium adsorption of methylene blue (MB) proved good uptake of the bulky dye, which improved considerably with impregnant concentration that was related to enhanced porosity. Dynamic removal of MB was carried out by running solutions of influent concentrations, of 100-200 mg/L, through a mini-column. Many column performance parameters were estimated at different stages on the typical S-shaped breakthrough curves: volume treated, amounts uptaken, bed service time, height of mass transfer zone, and column exhaustion characteristics. Increased impregnation ratio improved column performance, as well as forcing N2 pyrolysis or extra heat-treatment. Activated carbon impregnated with 70% H3PO4 and carbonized at 500°C exhibited the best properties which prevailed upon raising treated dye concentration to 150 and 200 mg/L, although degraded its capacity due to the limited mass of adsorbent and to the short contact time. (C) 2006 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Batch Adsorption, Porosity, Fixed-Bed Removal, Aqueous-Solutions, Phosphoric-Acid, Adsorption Characteristics, Rice-Husk, Fly-Ash, Water, Waste, Dyes, Shells, Lead

? Vijayaraghavan, K. and Yun, Y.S. (2008), Biosorption of C.I. Reactive Black 5 from aqueous solution using acid-treated biomass of brown seaweed *Laminaria* sp. *Dyes and Pigments*, **76** (3), 726-732.

Full Text: [2008\Dye Pig76, 726.pdf](2008/Dye%20Pig76,%20726.pdf)

Abstract: The biosorption of C.I. Reactive Black 5 (RB5) from aqueous solution, using the brown seaweed, Laminaria sp., was investigated in both batch and column modes of operation. Protonation of the native Landnaria biomass, with 0.1 M HCI, considerably improved its RB5 biosorption capacity. Evidence from FT-IR spectra confirmed the participation of amine groups in the biosorption of RB5 and the mechanism was proposed to be electrostatic interaction between the positively charged amine groups and negatively charged RB5. At various initial RB5 concentrations (50200 mg/l), batch sorption equilibrium was reached within 3 h, followed by slow attainment of equilibrium, and the kinetic data obtained were interpreted in terms of the pseudo-second order model. Biosorption isotherm experiments, under different pH and temperature conditions, revealed that decreasing the pH and increasing the temperature favored biosorption. The Langmuir, Freundlich and Redlich-Peterson models were used to describe the isotherm data; of which the Freundlich model described the isotherm data with high correlation coefficients and low percentage error values. According to the Langmuir model, the maximum RB5 uptake of 101.5 mg/g was observed at pH I and temperature of 40°C. Various thermodynamic parameters, such as ΔG°, ΔH° and ΔS°, were calculated, which indicated that the present system was spontaneous and endothermic process. A 0.01 M NaOH solution successfully eluted all dye from the RB5-loaded Laminaria biomass. The feasibility of the brown seaweed for the continuous removal of RB5 from aqueous solution was examined in an up-flow packed column (1 cm ID and 12 cm height). With a bed height, flow rate and initial RB5 concentration at 10 cm, 1 ml/min and 50 mg/l, respectively, the Laminaria biomass exhibited an RB5 uptake and removal efficiency of 41.9 mg/g and 72.7%, respectively. The column was successfully eluted using 0.01 M NaOH, with an elution efficiency of 97.7%. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Amine, Aqueous Solution, Batch, Batch Sorption, Biomass, Biosorption, Biosorption Capacity, Capacity, Column, Concentration, Concentrations, Correlation, Decolorization, Dye, Efficiency, Effluents, Electrostatic, Electrostatic Interaction, Elution, Endothermic, Equilibrium, Experiments, Flow, Flow Rate, Freundlich, Freundlich Model, FT-IR, FTIR, FTIR Spectra, G, Groups, Heavy-Metal Biosorption, Interaction, Isotherm, Isotherm Data, Kinetic, Langmuir, Langmuir Model, Low, Mechanism, Model, Modeling, Models, Naoh, Operation, Order, Packed Column, Parameters, Participation, pH, Process, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Rate, Rb5, Reactive Black 5, Redlich-Peterson, Removal, Removal Efficiency, Rhizopus-Arrhizus, Sargassum-Muticum, Seaweed, Sorption, Sorption Equilibrium, Spectra, Spontaneous, Temperature, Thermodynamic, Thermodynamic Parameters, Uptake, Waste, Waste-Water Treatment, Wastewaters

? Chairat, M., Rattanaphani, S., Bremner, J.B. and Rattanaphani, V. (2008), Adsorption kinetic study of lac dyeing on cotton. *Dyes and Pigments*, **76** (2), 435-439.

Full Text: [2008\Dye Pig76, 435.pdf](2008/Dye%20Pig76,%20435.pdf)

Abstract: Adsorption kinetics study of lac dyeing on cotton were carried out under dyeing conditions of pH 3.0, MLR 1: 100 and an initial dye concentration 480 +/- 10 mg/L. Pseudo first- and second-order kinetic models were used to examine the adsorption kinetic data. It was found that the adsorption kinetics of lac dyeing on cotton with pH control was found to follow the pseudo second-order kinetic model with an activation energy of 42.4 kJ/mol. (c) 2006 Elsevier Ltd. All fights reserved.

Keywords: Activation, Activation Energy, Adsorption, Adsorption Kinetic, Adsorption Kinetics, Aqueous-Solution, Concentration, Constitution, Control, Cotton, Dye, Dyeing, Energy, Kinetic, Kinetic Model, Kinetic Models, Kinetic Study, Kinetics, Kinetics Study, Lac Dye, Lac Dyeing, Laccaic Acid, Linked Chitosan Beads, Model, Models, pH, pH Control, Pigments, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo Second-Order, Pseudo-Second-Order, Reactive Dye, Second Order

? Won, S.W. and Yun, Y.S. (2008), Biosorptive removal of Reactive Yellow 2 using waste biomass from lysine fermentation process. *Dyes and Pigments*, **76** (2), 502-507

Full Text: [2008\Dye Pig76, 502.pdf](2008/Dye%20Pig76,%20502.pdf)

Abstract: The protonated waste biomass of *Corynebacterium glutamicum* discharged from an industrial lysine fermentation plant was used for the removal of Reactive Yellow 2 (RY2). To evaluate the biosorption capacity and characteristics, the effects of solution pH, dye concentration, and salts were investigated in a batch mode. Also, the influence of biomass leachate during biosorption process was specially focused. The optimum pH ranges for RY2 uptake was from 1 to 4, with the maximum sorption capacity of the biomass being as high as 178.5 ± 17.0 and 154.3 ± 14.7 mg g−1 at pH 1 and 2, respectively. As the solution pH increased, the dye uptake rapidly decreased, but was negligible under neutral conditions. At pH 7 and above, the biomass leaching was found to be an important factor in evaluating the biosorption performance. The biomass could be easily regenerated and successfully reused even up to the fourth cycle of sorption/desorption.

Keywords: Biosorption, Reactive Yellow 2, Isotherm, Desorption, Biomass Leaching, *Corynebacterium glutamicum*

? Gong, R.M., Jin, Y.B., Sun, J. and Zhong, K.D. (2008), Preparation and utilization of rice straw bearing carboxyl groups for removal of basic dyes from aqueous solution. *Dyes and Pigments*, **76** (2), 519-524.

Full Text: [2008\Dye Pig76, 519.pdf](2008/Dye%20Pig76,%20519.pdf)

Abstract: One kind of potentially biodegradable cationic sorbent with high sorption capacity of basic dyes was prepared by thermochemically esterifying oxalic acid onto rice straw, and then the esterified rice straw was further loaded with sodium ion for enhancing its cationic sorption capacity. The sorption of two basic dyes, basic blue 9 (BB9) and basic green 4 (BG4), from aqueous solutions onto modified product was investigated. The effects of various experimental parameters (e.g. initial pH, sorbent dosage, dye concentration, ion strength, contact time) were examined and optimal experimental conditions were decided. The BB9 and BG4 removal ratios came up to the maximum value beyond pH 6. The 2.0 g/l or above of sorbent could almost completely remove BB9 and BG4 from 250 mg/l of dye solution. The ratios of 13139 and BG4 sorbed kept above 97% over a range from 50 to 250 mg/l of dye concentration when 2.0 g/l of sorbent was used. Increase in ion strength of solution induced decline of BB9 and BG4 sorption. The isothermal data fitted well to the Langmuir and Freundlich models. The sorption processes could be described by the pseudo-second-order kinetic model. The results in this research confirmed that the OA-modified rice straw was an excellent basic dye sorbent. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Acid, Adsorption, Aqueous Solution, Aqueous Solutions, Azo-Dyes, Bagasse, Basic Blue 9, Basic Dye, Basic Dyes, Basic Green 4, Biodegradable, Capacity, Carboxyl, Carboxyl Groups, Cationic, Concentration, Contact Time, Crop Residues, Dosage, Dye, Dye Solution, Dyes, Effects, Effluents, Epichlorohydrin, Experimental, Freundlich, Groups, Ion, Isothermal, Kinetic, Kinetic Model, Kinetics, Langmuir, Metal-Ions, Model, Models, Modified, Oxalic Acid, Parameters, pH, Pseudo Second Order, Pseudo Second Order Kinetic, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Range, Removal, Research, Rice, Rice Straw, Sodium, Sodium Ion, Solutions, Sorbed, Sorbent, Sorption, Sorption, Sorption Capacity, Straw, Strength, Thermochemical Esterification, Time, Utilization, Value, Waste-Water

? Wang, C.C., Lee, C.K., Lyu, M.D. and Juang, L.C. (2008), Photocatalytic degradation of C.I. Basic Violet 10 using TiO2 catalysts supported by Y zeolite: An investigation of the effects of operational parameters. *Dyes and Pigments*, **76** (3), 817-824.

Full Text: [2008\Dye Pig76, 817.pdf](2008/Dye%20Pig76,%20817.pdf)

Abstract: The physical and chemical states of zeolite-supported TiO2 were evaluated via powder X-ray diffraction (XRD), Fourier transform infrared (FTIR) and nitrogen adsorption-desorption isotherms. The effects of operational parameters, including TiO2 content, calcination temperature, pH, initial dye concentration, as well as catalyst dosage, on photocatalytic degradation performance were examined. The photocatalytic reaction followed first-order kinetics for all catalysts; optimum photodegradation efficiency was found to result from the use of a high TiO2 concentration (20% TiO2), a calcination temperature of 600°C, alkaline pH (9-10) and a catalyst dosage of 5333 ppm. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Azo Dyes, Catalyst, Cationic Dye, Decomposition, Degradation, Operational Parameters, Orange-II, Photocatalytic Degradation, Photodegradation, Silica-Gel, Textile Wastewaters, TiO2, Titanium-Dioxide, Water, Y Zeolite

? Al-Degs, Y.S., El-Barghouthi, M.I., El-Sheikh, A.H. and Walker, G.A. (2008), Effect of solution pH, ionic strength, and temperature on adsorption behavior of reactive dyes on activated carbon. *Dyes and Pigments*, **77** (1), 16-23.

Full Text: [2008\Dye Pig77, 16.pdf](2008/Dye%20Pig77,%2016.pdf)

Abstract: The adsorption behavior of C.I. Reactive Blue 2, C.I. Reactive Red 4, and C.I. Reactive Yellow 2 from aqueous solution onto activated carbon was investigated under various experimental conditions. The adsorption capacity of activated carbon for reactive dyes was found to be relatively high. At pH 7.0 and 298 K, the maximum adsorption capacity for C.I. Reactive Blue 2, C.I. Reactive Yellow 2 and C.I. Reactive Red 4 dyes was found to be 0.27, 0.24, and 0. 11 mmol/g, respectively. The shape of the adsorption isotherms indicated an L2-type isotherm according to the Giles and Smith classification. The experimental adsorption data showed good correlation with the Langmuir and Ferundlich isotherm models. Further analysis indicated that the formation of a complete monolayer was not achieved, with the fraction of surface coverage found to be 0.45, 0.42, and 0.22 for C.I. Reactive Blue 2, C.I. Reactive Yellow 2 and C.I. Reactive Red 4 dyes, respectively. Experimental data indicated that the adsorption capacity of activated carbon for the dyes was higher in acidic rather than in basic solutions, and further indicated that the removal of dye increased with increase in the ionic strength of solution, this was attributed to aggregation of reactive dyes in solution. Thermodynamic studies indicated that the adsorption of reactive dyes onto activated carbon was an endothermic process. The adsorption enthalpy (Delta H-ads) for C.I. Reactive Blue 2 and C.I. Reactive Yellow 2 dyes were calculated at 42.2 and 36.2 kJ/mol, respectively. The negative values of free energy (Delta G(ads)) determined for these systems indicated that adsorption of reactive dyes was spontaneous at the temperatures under investigation (298-328 K). (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Adsorption Isotherms, Aqueous, Aqueous-Solutions, Capacity, Carbon, Classification, Congo-Red, Coverage, Dye, Dyes, Elsevier, Endothermic, Fly-Ash, Isotherm, Isotherms, Langmuir, Low-Cost Adsorbents, Models, pH, pH(pzc), Reactive Dyes, Reactive Red 4, Removal, Solutions, Sorption, Surface-Chemistry, Technologies, Temperature, Textile Effluent, Thermodynamic, Thermodynamic Studies, Toluene

? Crini, G. (2008), Kinetic and equilibrium studies on the removal of cationic dyes from aqueous solution by adsorption onto a cyclodextrin polymer. *Dyes and Pigments*, **77** (2), 415-426.

Full Text: [2008\Dye Pig77, 415.pdf](2008/Dye%20Pig77,%20415.pdf)

Abstract: Batch adsorption experiments were carried out for the removal of basic dyes, namely C.I. Basic Blue 3, Basic Violet 3 and Basic Violet 10, from aqueous solutions using a cyclodextrin polymer. Studies concerning the effects of contact time and initial dye concentration are presented and discussed. Results of batch experiments showed that this adsorbent exhibited high sorption capacities toward basic dyes. Experimental data were analyzed using pseudo-second order kinetics, mass transfer, and intraparticle diffusion models. It was found that kinetics followed a pseudo-second order equation, suggesting that the rate-limiting step may be chemisorption. Equilibrium isotherm data were analyzed according to Langmuir and Freundlich equations. The characteristic parameters for each model have been determined. The Freundlich isotherm gave the best correlation for the adsorption of basic dyes on CDP material. On the basis of the Langmuir analysis, the maximum adsorption capacities were determined to be 53.2, 42.4 and 35.8 mg of dye per gram of polymer for C.I. Basic Violet 3, C.I. Basic Blue 3, and Basic Violet 3, respectively. The differences in adsorption capacities may be due to the effect of dye structure. The negative value of free energy change indicated the spontaneous nature of adsorption. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Acid Dyes, Adsorbent, Adsorption, Anionic Dyes, Azo Dyes, Basic Dyes, Basic-Dyes, Batch Study, Beta-Cyclodextrin, Cyclodextrin, Equilibrium, Intraparticle Mass-Transport, Isotherm, Kinetics, Methylene-Blue, Reactive Dye, Sorption, Textile Waste-Water

? Kumar, K.V. and Porkodi, K. (2008), Comments on “Removal of Congo red from aqueous solution by anilinepropylsilica xerogel” by Pavan FA, Dias SLP, Lima EC, Benvenutti EV. Dyes and Pigments 2008; 76: 64-9. *Dyes and Pigments*, **77** (2), 481-482.

Full Text: [2008\Dye Pig77, 481.pdf](2008/Dye%20Pig77,%20481.pdf)

Keywords: Sorption Isotherm Parameters, Activated Carbon, Nonlinear Method

? Pavan, F.A., Dias, S.L.P., Lima, E.C. and Benvenutti, E.V. (2009), Response to the letter to the editor that was published in dyes and pigments 77 (2008) 481-482. *Dyes and Pigments*, **83** (2), 266.

Full Text: [2009\Dye Pig83, 266.pdf](2009/Dye%20Pig83,%20266.pdf); [2009\Dye Pig83, 266-1.pdf](2009/Dye%20Pig83,%20266-1.pdf)

Keywords: Anilinepropylsilica Xerogel, Aqueous-Solution, Congo-Red, Dyes, Nov, Removal

? Sevim, A.M., Hojiyev, R., Gül, A. and Çelik, M.S. (2011), An investigation of the kinetics and thermodynamics of the adsorption of a cationic cobalt porphyrazine onto sepiolite. *Dyes and Pigments*, **88** (1), 25-38.

Full Text: [2010\Dye Pig88, 25.pdf](2010/Dye%20Pig88,%2025.pdf)

Abstract: The adsorption of [octakis(2-trimethylammoniumethylsulfanyl)-porphyrazinatocobaltloctaiodi de from aqueous solution onto negatively charged sepiolite is investigated The effects of temperature, dye and solid concentration and contact time on adsorption were evaluated. Adsorption experiments were analyzed in the light of zeta potential measurements and desorption behavior of the dye sepiolite composite. Experimental data were analyzed using four adsorption kinetic models, of which a pseudo-second-order kinetic model was found to be superior Experimental equilibrium data were fitted to live adsorption isotherm models, from which the free energy, enthalpy and entropy of the adsorption processes were determined Adsorption onto sepiolite was exothermic and spontaneous AAS and FTIR were used to elucidate the adsorption mechanism. The novel composite is considered to be useful in optical and catalytic applications (C) 2010 Elsevier Ltd All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Isotherm Models, Adsorption Kinetic, Adsorption Mechanism, Aqueous Solution, Aqueous-Solutions, Behavior, Biomimetic Oxidation, Catalysts, Catalytic Applications, Cationic Dye, Clay, Cobalt, Composite, Concentration, Data, Desorption, Dye, Energy, Enthalpy, Entropy, Equilibrium, Exothermic, Experiments, FTIR, Investigation, Isotherm, Isotherm Models, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Kinetics and Thermodynamics, Mechanism, Methylene-Blue, Model, Models, Porphyrazine, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Reactive Dye, Removal, Rights, Sepiolite, Solution, Surfactant-Modified Montmorillonite, Temperature, Thermodynamics, Zeta Potential

# Title: Dyna-Colombia

Full Journal Title: [Dyna-Colombia](http://redalyc.uaemex.mx/src/inicio/HomRevRed.jsp?iCveEntRev=496)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Rojas-Sola, J.I. and De San-Antonio-Gómez, C. (2010), Bibliometric analysis of Colombian scientific publications in engineering, multidisciplinary subject category in Web of Science database (1997-2009). *Dyna-Colombia*, **77** (164), 9-17.

Full Text: [2010\Dyn-Col77, 9.pdf](2010/Dyn-Col77,%209.pdf)

Abstract: The work has characterized the area of Engineering, Multidisciplinary in Colombia, reviewing the work of Colombian researchers in universities and published in international journals with impact factor between 1997 and 2009, at institutional level through Web of Science database. In the context of Latin America have been published 2,195 jobs (article or review) in 83 journals, and at the level of Colombia have found 419 articles published in 23 journals. Also, the universities have been analyzed by bibliometric indicators (Weighted and Relative Impact Factor and average number of citations per document), and found all the scientific production located in 37 Universities and stressing the Universidad Nacional de Colombia for the number of documents, the University Pontificia Bolivariana appointments by the rate cites against documents, and the Pedagogical and Technological University of Colombia on the impact factor.

Keywords: Bibliometric, Bibliometric Indicators, Bibliometrics, Citations, Colombia, Colombian Publications, Context, Database, Engineering Multidiciplinary, Impact, Impact Factor, Impact Factors, Indicators, International, Journals, Latin America, Performance, Review, SCI, Scientific Production, Spanish, Statistical Properties, Universities, Web of Science, Work

# Title: Dynamis

Full Journal Title: Dynamis

ISO Abbreviated Title: Dynamis

JCR Abbreviated Title: Dynamis

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Gomez, T.O. (2008), Doctoral thesis on women’s studies in Spanish universities (1976-2005). Bibliometric analysis and bibliographical repertory. *Dynamis*, **28**, 472-474.

Keywords: Analysis, Bibliometric, Bibliometric Analysis, Spanish, Universities

# Title: Early Intervention in Psychiatry

Full Journal Title: Early Intervention in Psychiatry

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Gladstone, B.M., Boydell, K.M., Seeman, M.V. and McKeever, P.D. (2011), Children’s experiences of parental mental illness: A literature review. *Early Intervention in Psychiatry*, **5** (4), 271-289.

Full Text: [2011\Ear Int Psy5, 271.pdf](2011/Ear%20Int%20Psy5,%20271.pdf)

Abstract: Aim: This paper provides a review of published qualitative research on children’s experiences of parental mental illness. Methods: We undertook a comprehensive search of Medical Literature Analysis and Retrieval System Online, PsycINFO, Cumulative Index to Nursing and Allied Health Literature, Sociological Abstracts and Applied Social Sciences Index and Abstracts databases, as well as citation searches in Web of Science and manual searches of other relevant journals and reference lists of primary papers. Results: Although 20 studies met the search criteria, only 10 focused exclusively on children’s descriptions of their experience - the remainder elicited adults’ perspectives on children’s experiences of parental mental illnesses. Findings are organized under three themes: the impact of illness on children’s daily life, how children cope with their experiences and how children understand mental illness. Conclusions: Despite references to pervasive knowledge gaps in the literature, significant information has been accumulated about children’s experiences of parental mental illness. Considerable variability in research findings and tensions remain unresolved. For example, evidence is mixed as to children’s knowledge and understanding of mental illnesses and how best to deploy resources to help them acquire optimal information. Furthermore, children’s desire to be recognized as important to their parents’ well-being conflicted with adults’ perceptions that children should be protected from too much responsibility. Nevertheless, the cumulative evidence remains a key reason for advocating for psychoeducation and peer-support group interventions for children, which are endorsed by child and adult study participants alike.

Keywords: Adolescent, Adult, Adults, Child, Children, Citation, Databases, Health, Health-Services, Ill Parents, Impact, Information, Interventions, Journals, Knowledge, Literature, Literature Review, Mental Illness, Methods, Nursing, Papers, Parental Mental Illness, Parents, Perceptions, Primary, Psychiatric-Disorder, Psychosis, Qualitative, Qualitative Research, Qualitative Research, Research, Resilience, Responsibility, Review, Risk, Schizophrenia, Science, Sciences, Social Sciences, Thematic Review, Variability, Web of Science, Well-Being, Young-People

# Title: Early Popular Visual Culture

Full Journal Title: Early Popular Visual Culture

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Burrows, J. (2010), Near broke, but no tramp: Billie Ritchie, Charlie Chaplin and ‘that costume’. *Early Popular Visual Culture*, **8** (3), 247-262.

Abstract: This article revisits the various claims and counter-claims that have been made over the years as to whether the 1910s music hall comedian turned slapstick film star Billie Ritchie stole his costume and comic persona from Charlie Chaplin, or was himself the victim of plagiarism on Chaplin’s part. It proposes that neither of these arguments can be definitively supported on the basis of evidence available in the public domain, but also draws attention to the fact that there are other factors in play that may plausibly explain the various similarities between the two comedians as the result of shared formative influences rather than outright imitation, and that some contemporaries deemed it eminently reasonable to take such a view. The article moves on to consider the significance of the fact that, although their costumes were practically identical, Ritchie typically played dissolute gentlemen of ambiguous class status rather than tramps. It concludes that there is a stronger argument to be made that, rather than seeking to represent vagrancy, both Chaplin and Ritchie originally used the iconic ‘tramp’ costume to poke fun at the culturally ubiquitous Edwardian figure of the ‘masher’ - a lower-middle- or working-class male pleasure-seeker trying (and in their incarnations, failing) to emulate the fashions of his social superiors.

Keywords: Billie Ritchie, Charlie Chaplin, Costume, Imitation, Mashers, Plagiarism, Slapstick Comedy

# Title: Earth Planets and Space

Full Journal Title: Earth Planets and Space

ISO Abbreviated Title: Earth. Planets. Space.

JCR Abbreviated Title: Earth Planets Space

ISSN: 1343-8832

Issues/Year: 11

Journal Country/Territory: Japan

Language: English

Publisher: Terra Scientific Publ Co

Publisher Address: 2003 Sansei Jiyugaoka Haimu, 5-27-19 Okusawa, Setagaya-Ku, Tokyo 158, Japan

Subject Categories:

Geosciences, Interdisciplinary: Impact Factor 0.630, / (2000)

Yoshida, S., Seta, G., Okubo, S. and Kobayashi, S. (1999), Absolute gravity change associated with the March 1997 earthquake swarm in the Izu Peninsula, Japan. *Earth Planets and Space*, **51** (1), 3-12.

Abstract: We carried out both absolute and relative gravity measurements in the Izu Peninsula just before and after the March 1997 earthquake swarm occurred. The measurements revealed significant absolute gravity changes, which we find to be made of three spatial components. The first one is located near Cape Kawana, and would be associated with the volcanic activity that caused the earthquake swarm. The second one would be associated with shallow and localized magma intrusion just beneath Ito. The third one may be due to a change in the deep region beneath the Kita-Izu fault system, which is considered to be a major tectonic line of this region. The gravity changes can be used to detect underground mass movement. For this purpose, we first use crustal movement observations to construct an elastic dislocation model with two tensile faults and a left lateral fault. Then we use the gravity changes to constrain the density of the material which filled the tensile faults. We find that the density is likely to be small, and that the gravity changes of the first component are reproduced well by the fault model. The smallness of the density implies that highly vesiculated magma or water would have injected into the faults.

Rikitake, T. (1999), Probability of a great earthquake to recur in the Tokai district, Japan: Reevaluation based on newly-developed paleoseismology, plate tectonics, tsunami study, micro-seismicity and geodetic measurements. *Earth Planets and Space*, **51** (3), 147-157.

Abstract: In light of newly-acquired geophysical information about earthquake generation in the Tokai area, Central Japan, where occurrence of a great earthquake of magnitude 8 or so has recently been feared, probabilities of earthquake occurrence in the near future are reevaluated. Much of the data used for evaluation here relies on recently-developed paleoseismology, tsunami study and GPS geodesy.

The new Weibull distribution analysis of recurrence tendency of great earthquakes in the Tokai-Nankai zone indicates that the mean return period of great earthquakes there is estimated as 109 yr with a standard deviation amounting to 33 yr. These values do not differ much from those of previous studies (Rikitake, 1976, 1986, Utsu, 1984).

Taking the newly-determined velocities of the motion of Philippine Sea plate at various portions of the Tokai-Nankai zone into account, the ultimate displacements to rupture at the plate boundary are obtained. A Weibull distribution analysis results in the mean ultimate displacement amounting to 4.70 m with a standard deviation estimated as 0.86 m. A return period amounting to 117 yr is obtained at the Suruga Bay portion by dividing the mean ultimate displacement by the relative plate velocity.

With the aid of the fault models as determined from the tsunami studies, the increases in the cumulative seismic slips associated with the great earthquakes are examined at various portions of the zone. It appears that a slip-predictable model can better be applied to the occurrence mode of great earthquakes in the zone than a time-predictable model. The crustal strain accumulating over the Tokai area as estimated from the newly-developed geodetic work including the GPS observations is compared to the ultimate strain presumed by the above two models.

The probabilities for a great earthquake to recur in the Tokai district are then estimated with the aid of the Weibull analysis parameters obtained for the four cases discussed in the above. All the probabilities evaluated for the four cases take on values ranging 35-45 percent for a ten-year period following the year 2000.

Keywords: 1946 Nankaido Earthquake, Model, Motion

? Honkura, Y., Nagaya, Y. and Kuroki, H. (1999), Effects of seamounts on an interplate earthquake at the Suruga trough, Japan. *Earth Planets and Space*, **51** (6), 449-454.

Abstract: In light of newly-acquired geophysical information about earthquake generation in the Tokai area, Central Japan, where occurrence of a great earthquake of magnitude 8 or so has recently been feared, probabilities of earthquake occurrence in the near future are reevaluated. Much of the data used for evaluation here relies on recently-developed paleoseismology, tsunami study and GPS geodesy. The new Weibull distribution analysis of recurrence tendency of great earthquakes in the Tokai-Nankai zone indicates that the mean return period of great earthquakes there is estimated as 109 yr with a standard deviation amounting to 33 yr. These values do not differ much from those of previous studies (Rikitake, 1976, 1986, Utsu, 1984). Taking the newly-determined velocities of the motion of Philippine Sea plate at various portions of the Tokai-Nankai zone into account, the ultimate displacements to rupture at the plate boundary are obtained. A Weibull distribution analysis results in the mean ultimate displacement amounting to 4.70 m with a standard deviation estimated as 0.86 m. A return period amounting to 117 yr is obtained at the Suruga Bay portion by dividing the mean ultimate displacement by the relative plate velocity. With the aid of the fault models as determined from the tsunami studies, the increases in the cumulative seismic slips associated with the great earthquakes are examined at various portions of the zone. It appears that a slip-predictable model can better be applied to the occurrence mode of great earthquakes in the zone than a time-predictable model. The crustal strain accumulating over the Tokai area as estimated from the newly-developed geodetic work including the GPS observations is compared to the ultimate strain presumed by the above two models. The probabilities for a great earthquake to recur in the Tokai district are then estimated with the aid of the Weibull analysis parameters obtained for the four cases discussed in the above. All the probabilities evaluated for the four cases take on values ranging 35-45 percent for a ten-year period following the year 2000.

# Title: Earthquake Engineering Frontiers in the New Millennium

Full Journal Title: Earthquake Engineering Frontiers in the New Millennium

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Cheng, G.D. and Kong, X.J. (2001), Some recent work in earthquake engineering at Dalian University of Technology in *Earthquake Engineering Frontiers in the New Millennium* (Eds. Spencer, B.F. and Hu, Y.X.), 139-142.

Full Text: 2001\Ear Eng Fro New Mil, 139.pdf

Abstract: Dalian University of Technology has been engaged in Leaching and research of earthquake engineering for a long time. Research activities cover numerical simulation, shaking table test and design methodology for dam, offshore platform, high-rise building, masonry structures subjected to earthquake environment and hazard mitigation. Collaboration with US and other countries contributes to our achievement a great deal. Three on-going research areas are briefly reported. Under financial support of National ‘211’ project of Chinese government, an underwater shaking table is installed in 2000. It enhances the capacity of research on water-structure-soil at DUT. Fast computational scheme for structural random response has been carried out and extended to problems with damping and control. This approach will open new possibility to take uncertainty of earthquake into consideration of design. Performance-based structural system reliability and related structural optimization is discussed.

Keywords: Random Seismic Responses

# Title: Earthquake Engineering & Structural Dynamics

Full Journal Title: [Earthquake Engineering & Structural Dynamics](http://www3.interscience.wiley.com/cgi-bin/jtoc?ID=1922)

ISO Abbreviated Title: Earthq. Eng. Struct. Dyn.

JCR Abbreviated Title: Earthquake Eng Struc

ISSN: 0098-8847

Issues/Year: 8

Journal Country/Territory: United States

Language: English

Publisher: John Wiley & Sons Ltd

Publisher Address: Baffins Lane Chichester, W Sussex PO19 1UD, England

Subject Categories:

Engineering, Geological Geosciences, Interdisciplinary: Impact Factor

Iida, M. (1998), Three-dimensional non-linear soil-building interaction analysis in the lakebed zone of Mexico City during the hypothetical Guerrero earthquake. *Earthquake Engineering & Structural Dynamics*, **27** (12), 1483-1502.

Full Text: [E\Ear Eng Str Dyn27, 1483.pdf](E/Ear%20Eng%20Str%20Dyn27,%201483.pdf)

Abstract: The 1985 Michoacan earthquake (M = 8.1) caused very severe damage to mid-rise buildings in the lakebed zone of Mexico City, which is approximately 400 km from the epicentre in the Pacific Ocean. In the present study, we perform a three-dimensional (3-D) non-linear soil-building interaction analysis for several types of low-to high-rise buildings during the hypothetical Guerrero earthquake, and try to understand the real cause of heavy damage to mid-rise buildings in the lakebed zone during the 1985 Michoacan earthquake. We make a reasonable estimation of the input earthquake motions and the local site effects. The non-linear soil-building interaction analysis explains the damage pattern observed during the 1985 earthquake, although other analyses do not. We realize that all the factors from the earthquake source to the building superstructure must be taken into account adequately.

Hayashi, Y., Tamura, K., Mori, M. and Takahashi, I. (1999), Simulation analyses of buildings damaged in the 1995 Kobe, Japan, earthquake considering soil-structure interaction. *Earthquake Engineering & Structural Dynamics*, **28** (4), 371-391.

Full Text: [E\Ear Eng Str Dyn28, 371.pdf](E/Ear%20Eng%20Str%20Dyn28,%20371.pdf)

Abstract: A series of studies was conducted on three buildings of steel reinforced concrete structures with RC shear walls damaged in the 1995 Hyogo-ken Nanbu earthquake. These buildings are located in an area where structural damage centred around. Two of these buildings suffered severe damage, while the third was not structurally damaged. Our studies deal with site inspections, including micro-tremor measurement of buildings, the evaluation of input motions, and the response analyses considering soil-structure interaction. The results of simulation analyses of the two severely damaged buildings correspond to their actual damage state. From the response analyses of the one slender building with no structural damage, it was concluded that uplifting is the main reason it did not suffer any structural damage. Through these studies, the importance of soil-structure interaction and effective input motion is fully understood.

# Title: Earth Surface Processes and Landforms

Full Journal Title: [Earth Surface Processes and Landforms](http://www3.interscience.wiley.com/cgi-bin/jhome/2388)

ISO Abbreviated Title: Earth Surf. Process. Landf.

JCR Abbreviated Title: Earth Surf Proc Land

ISSN: 0197-9337

Issues/Year: 8

Journal Country/Territory: England

Language: English

Publisher: John Wiley & Sons Ltd

Publisher Address: Baffins Lane Chichester, W Sussex PO19 1UD, England

Subject Categories:

Geography Geosciences, Interdisciplinary: Impact Factor

? Taylor, M.P. and Lewin, J. (1996), River behavior and holocene alluviation: The river Severn at Welshpool, Mid Wales, UK. *Earth Surface Processes and Landforms*, **21** (1), 77-91.

Full Text: Ear Sur Pro Lan21, 77

Abstract: A combination of archaeological evidence, C-14 dates, terrace mapping, heavy metal analysis, grain size analysis and historical maps is used in a detailed analysis of the alluvial history of the River Severn floodplain around Welshpool in mid-Wales, U.K. ‘Welshpool Gravels’ underlie a higher terrace surface up to 6-7 m above the present channel. They form a sequence of gravels at least 30 m in thickness. The upper surface is characterized by a series of braided palaeochannel patterns. These sediments were probably deposited at the end of the last glaciation as outwash and are contemporaneous with other high, gravelly terrace deposits found in the Severn and other mid-Wales basins. Overlying the Welshpool Gravels on the contemporary floodplain are a variable thickness of finer sediments, the ‘Leighton Silts’. Morphological mapping and dating of two cut-offs to 2850±60 a sp and 1190±70 a sp indicates that a channel pattern similar to the present planform had formed by the mid to late Holocene. From this period, floodplain development has been dominated by a single-thread meandering channel with fine vertical sedimentation and limited lateral gravel accretion. Abandonment of extended lengths of channel formed by an avulsion mechanism is apparent. A combination of historical map data, C-14 dates and the analysis for heavy metals in fine sediments, which were washed into the river system during mining, indicates that there has been at least 4 m of sedimentation since the early 17th century, but only in a central belt of varying width. Metal-rich waste, identified in the fine sediments of this zone of ‘Trehelig Silts’, indicates those areas which were most heavily sedimented during the peak of metalliferous mining in the 18th and 19th centuries. Although the near-channel margins appear to be superficially similar to the older floodplain, the spatial and vertical pattern of historic sedimentation is complex and is not reflected in marked elevation differences. The division of sedimentation periods into these three broad time-spans (Late Quaternary Terraces, Late Holocene alluviation and avulsion and the historical metal-mining period) shows that an apparently simple planar floodplain is in reality underlain by complex sedimentation units. Floodplain construction has involved the development of inset units, in cut-offs and adjacent to migrating channels, as well as the expected contrasts between in-channel and overbank environments. This has implications both for alluvial sedimentation modelling and for the identification of high-pollution zones on the floodplain. These cannot be predicted on the basis of simple ‘in-channel’ and ‘overbank’ environments given the historically complex evolution.

? Dorn, R.I. (2002), Analysis of geomorphology citations in the last quarter of the 20th century. *Earth Surface Processes and Landforms*, **27** (6), 667-672.

Full Text: [2002\Ear Sur Pro Lan27, 667.pdf](2002/Ear%20Sur%20Pro%20Lan27,%20667.pdf)

Abstract: Three hundred and twenty-eight geomorphology articles published in the last quarter of the 20th century were cited 20 or more times in Institute for Scientific Information (ISI) indices, as of 15 May 2001. At the close of the 20th century, well-cited geomorphology is highly multidisciplinary and interdisciplinary with the most dominant fields being ill biological, civil engineering, earth science, geography, geological, and soils disciplines. The very strong English-language bias of well-cited journal articles creates a geographical bias in Study site selection, which May ill turn bias geomorphic theory. Water-based research (fluvial processes and landforms, riparian, drainage basin) dominates well-cited papers, with the ‘hottest’ subfield in the 1990s being riparian research with a biological emphasis. Over 90 journals publish well-cited papers, but Earth Surface Processes and Landforms hosts the largest number of well-cited papers. Copyright (C) 2002 John Wiley Sons, Ltd.

Keywords: Geomorphology, Landform, Earth Surface Processes, Citation, Bibliometric, Temporal, Time Trends, Publications, Authors, Time

# Title: Earth System Monitor

Full Journal Title: [Earth System Monitor](http://www.nodc.noaa.gov/General/NODCPubs/ESM/esm.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Lockridge, P.A. (2000), GDC monitors frequency of recent destructive tsunami events: Scientists examine possible recent increase in the occurrence of tsunamis. *Earth System Monitor*, **5** (4), 1-6.

Full Text: [E\Ear Sys Mon5, 1.pdf](E/Ear%20Sys%20Mon5,%201.pdf)

Habermann, T., Lockridge, P. and Whiteside, L. (2000), The Spitak earthquake database: Integrated online and desktop access to natural hazards information: International effort produces complete database from 1988 Armenian earthquake studies. *Earth System Monitor*, **5** (4), 7-8.

Full Text: [E\Ear Sys Mon5, 1.pdf](E/Ear%20Sys%20Mon5,%201.pdf)

Gilhousen, D.B. (2000), NDBC develops advanced electronic bulletin board system: New graphical user interface eases access to high-quality marine data. *Earth System Monitor*, **5** (4), 9-12.

Full Text: [E\Ear Sys Mon5, 1.pdf](E/Ear%20Sys%20Mon5,%201.pdf)

# Title: East African Medical Journal

Full Journal Title: East African Medical Journal

ISO Abbreviated Title: East Afr. Med. J.

JCR Abbreviated Title: E Afr Med J

ISSN: 0012-835X

Issues/Year: 12

Journal Country/Territory: Kenya

Language: English

Publisher: East African Medical Journal

Publisher Address: Chyulu Road PO Box 41632, Nairobi, Kenya

Subject Categories:

Medicine, General & Internal: Impact Factor

? Nordberg, E. (1998), Ethics and publishing: An East African perspective. *East African Medical Journal*, **75** (6), S41-S43.

Abstract: Each hind of publishing is associated with its specific mix of ethical problems and concerns. Publishing of technical books is linked to issues of authorship, copyright and affordability by the target group. Publishing of journals, including EAMJ, raises issues of research ethics, authorship, and commercial advertising. Some of these ethical issues are moire prominent and more important in sub-Saharan Africa than elsewhere, and this article focusses on three: (i) authorship and acknowledgements, (II) access to information serving important readers and, (iii) possible bias related to commercial advertising. In a competitive professional and academic environment where the careers of those who publish scientific materials under their own name are likely to benefit significantly, authorship credentials become important and subject to pressure, possibly unethical behaviour. It may be demanded by influential individuals and allowed when not deserved, Controls are in place but not very effective and under continuing development. For an African health or medical journal to reach a fair proportion bf important health care providers, researchers and trainers, the target group has to be defined and its level of knowledge and awareness explored. The group should preferably include middle level staff who provide most of the services, and most of them in this group have very poor access to periodicals both in printed and electronic form and also often have difficulties absorbing effectively the materials published. Commercial advertising generates revenue and helps lower journal subscription rates. This makes the journal ri,ore affordable to middle income health workers but may, more or less consciously, affect editorial independence with possible bias in favour of the advertisers and their products and loss of credibility in the eyes of readers.

Keywords: Authorship

? Kulmala, T., Vaahtera, M., Ndekha, M., Cullinan, T., Salin, M.L, Koivisto, A.M. and Ashorn, P. (2000), Socio-economic support for good health in rural Malawi. *East African Medical Journal*, **77** (3), 168-171.

Abstract: Objective: To study the socio-economic support for good health among subsistence farmers in rural Malawi. Design: A cross-sectional survey. Setting: Lungwena, a rural area with 17000 inhabitants in southern Malawi. Participants: Seven hundred and ninety five pregnant women who attended the! antenatal clinic at Lungwena Health Centre between June 1995 and September 1996, Interventions: Interviews about socio-economic conditions, Measurements of cultivated land areas and distances between home and the local health centre, Main outcome measures: Proportion of households lacking literate adults, adequate water source and sanitation, easy access to modern health care or food security. Results: Only 14% of the interviewed women could read and write and half of the households had no literate members. Every fifth household was lacking both an access to safe drinking water and a proper sanitary facility. The distance to the health centre was more than 5 km among half of the households and only 37% had enough land to grow food for all family members. When other potential means of obtaining food were taken into account, 27% of the households had no food security. Numerous households were lacking more than one socioeconomic prerequisites of good health: three or more were missing from a quarter of the families. Conclusions: Socio-economic prerequisites of health were commonly missing in Lungwena, Subsequent health interventions should strengthen the investments into general poverty alleviation.

Keywords: Maternal Education

# Title: Ecologic Science

Full Journal Title: [Ecologic Science](http://hydrobio.jnu.edu.cn/05magzine/04.htm)

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ISSN:

Issues/Year:

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Language:

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Subject Categories:

: Impact Factor

? Huang, F.R., Yin, H., Peng, H. and Liu, H.S. (2004), Study of kinetics and desorption of copper biosorption by *Rhodospirillum*. *Ecologic Engineering*, **23** (1), 35-37.

Full Text: [2004\Eco Eng23, 35.pdf](2004/Eco%20Eng23,%2035.pdf)

Abstract: The kinetics analysis of copper onto the Rhodospirillum was investigated. Under the experimental conditions, the biosorption equilibrium was achieved within 45min, the most biosorption capacity could reach 48.23 mg·g-1. In order to analyze the biosorption kinetics of Cu2+, the pseudo-first-order and the pseudo-second-order kinetic models were applied to the data. The results showed that the pseudo-second-order kinetic model fitted well with the experimental data. It was found that EDTA and citric acid were the effective eluants for the elution of adsorbed copper by Rhodospirillum, the elution efficiency were 86.4%, 66.9%, respectively. The abio-acid and the abio-salt were the noneffecive eluants,the elution efficiences were all about 20%. The analysis of the X-ray diffraction spectra indicated that the bacteria did not form new crystal after the adsorption and some of the crystal of the bacteria had transformed into non- crystal.

Keywords: Rhodospirillum, Biosorption Kinetics, Desorption, X-Ray Diffraction

# Title: Ecological Applications

Full Journal Title: Ecological Applications

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: Impact Factor

Notes: highly cited

? Gorham, E. (1991), Northern peatlands - Role in the carbon-cycle and probable responses to climatic warming. *Ecological Applications*, **1** (2), 182-195.

Full Text: [1991\Eco App1, 182.pdf](1991/Eco%20App1,%20182.pdf)

Abstract: Boreal and subarctic peatlands comprise a carbon pool of 455 Pg that has accumulated during the postglacial period at an average net rate of 0.096 Pg/yr (1 Pg = 10(15) g). Using Clymo’s (1984) model, the current rate is estimated at 0.076 Pg/yr. Long-term drainage of these peatlands is estimated to be causing the oxidation to CO2 of a little more than 0.0085 Pg/yr, with combustion of fuel peat adding almost-equal-to 0.026 Pg/yr. Emissions of CH4 are estimated to release almost-equal-to 0.046 Pg of carbon annually. Uncertainties beset estimates of both stocks and fluxes, particularly with regard to Soviet peatlands. The influence of water table alterations upon fluxes of both CO2 and CH4 is in great need of investigation over a wide range of peatland environments, especially in regions where permafrost melting, thermokarst erosion, and the development of thaw lakes are likely results of climatic warming. The role of fire in the carbon cycle of peatlands also deserves increased attention. Finally, satellite-monitoring of the abundance of open water in the peatlands of the West Siberian Plain and the Hudson/James Bay Lowland is suggested as a likely method of detecting early effects of climatic warming upon boreal and subarctic peatlands.

Keywords: Arctic Tundra, Atmospheric Methane, Balance, Biomass, Carbon, Carbon Cycle, Carbon Dioxide, CH4, Climate Warming, CO2, Combustion, Development, Dioxide, Drainage, Ecosystems, Erosion, Estimates, Fluxes, Greenhouse Effect, Investigation, Lakes, Landforms, Methane, Minnesota, Mires, Model, Open, Oxidation, Patterned Mires, Peat, Peatlands, Red Lake Peatland, Release, Role, Soil-Nitrogen, Water, Water Table

Notes: highly cited

? Vitousek, P.M., Aber, J.D., Howarth, R.W., Likens, G.E., Matson, P.A., Schindler, D.W., Schlesinger, W.H. and Tilman, G.D. (1997), Human alteration of the global nitrogen cycle: Sources and consequences. *Ecological Applications*, **7** (3), 737-750.

Full Text: [1997\Eco App7, 737.pdf](1997/Eco%20App7,%20737.pdf)

Abstract: Nitrogen is a key element controlling the species composition, diversity, dynamics, and functioning of many terrestrial, freshwater, and marine ecosystems. Many of the original plant species living in these ecosystems are adapted to, and function optimally in, soils and solutions with low levels of available nitrogen. The growth and dynamics of herbivore populations, and ultimately those of their predators, also are affected by N. Agriculture, combustion of fossil fuels, and other human activities have altered the global cycle of N substantially, generally increasing both the availability and the mobility of N over large regions of Earth. The mobility of N means that while most deliberate applications of N occur locally, their influence spreads regionally and even globally, Moreover, many of the mobile forms of N themselves have environmental consequences. Although most nitrogen inputs serve human needs such as agricultural production, their environmental consequences are serious and long term. Based on our review of available scientific evidence, we are certain that human alterations of the nitrogen cycle have: 1) approximately doubled the rate of nitrogen input into the terrestrial nitrogen cycle, with these rates still increasing; 2) increased concentrations of the potent greenhouse gas N2O globally, and increased concentrations of other oxides of nitrogen that drive the formation of photochemical smog over large regions of Earth; 3) caused losses of soil nutrients, such as calcium and potassium, that are essential for the long-term maintenance of soil fertility; 4) contributed substantially to the acidification of soils, streams, and lakes in several regions; and 5) greatly increased the transfer of nitrogen through rivers to estuaries and coastal oceans. In addition, based on our review of available scientific evidence we are confident that human alterations of the nitrogen cycle have: 6) increased the quantity of organic carbon stored within terrestrial ecosystems; 7) accelerated losses of biological diversity, especially losses of plants adapted to efficient use of nitrogen, and losses of the animals and microorganisms that depend on them; and 8) caused changes in the composition and functioning of estuarine and nearshore ecosystems, and contributed to long-term declines in coastal marine fisheries.

Keywords: Acidification, Agricultural, Agricultural Production, Agriculture And The Global N Cycle, Animals, Anthropogenic Global Change, Availability, Biological, Biological Diversity, Biological Diversity And The Nitrogen Cycle, Calcium, Carbon, Changes, Coastal, Combustion, Composition, Deposition, Diversity, Drive, Dynamics, Ecosystem Functioning,Control By N, Ecosystems, Environmental, Estuaries, Eutrophication, Eutrophication Of Estuaries, Evidence, Fertility, Fisheries, Forest Ecosystems, Forms, Fossil, Fossil Fuels, Freshwater, Function, Global N-Cycle Alteration,Scientific Consensus On, Grassland, Greenhouse, Greenhouse Gas, Growth, Human, Human Activities, Lakes, Limitation, Living, Long Term, Long-Term, Losses, Microorganisms, Mobile, Mobility, N, Needs, Nitrogen, Nitrogen And Land-Water Interactions, Nitrogen Cycle, Nitrogen Cycle, Global, Nitrogen Deposition And Nitrogen Loss, Nitrogen-Containing Trace Gases, Nutrients, Organic, Organic Carbon, Oxides, Plant, Plants, Population-Growth, Populations, Potassium, Rates, Review, Rivers, Saturation, Scientific Evidence, Soil, Soils, Solutions, Species, Streams, Term, Terrestrial

Notes: highly cited

? Carpenter, S.R., Caraco, N.F., Correll, D.L., Howarth, R.W., Sharpley, A.N. and Smith, V.H. (1998), Nonpoint pollution of surface waters with phosphorus and nitrogen. *Ecological Applications*, **8** (3), 559-568.

Full Text: [1998\Eco App8, 559.pdf](1998/Eco%20App8,%20559.pdf)

Abstract: Agriculture and urban activities are major sources of phosphorus and nitrogen to aquatic ecosystems. Atmospheric deposition further contributes as a source of N. These nonpoint inputs of nutrients are difficult to measure and regulate because they derive from activities dispersed over wide areas of land and are variable in time due to effects of weather. In aquatic ecosystems, these nutrients cause diverse problems such as toxic algal blooms, loss of oxygen, fish kills, loss of biodiversity (including species important for commerce and recreation), loss of aquatic plant beds and coral reefs, and other problems. Nutrient enrichment seriously degrades aquatic ecosystems and impairs the use of water for drinking, industry, agriculture, recreation, and other purposes. Based on our review of the scientific literature, we are certain that (1) eutrophication is a widespread problem in rivers, lakes, estuaries, and coastal oceans, caused by over-enrichment with P and N; (2) nonpoint pollution, a major source of P and N to surface waters of the United States, results primarily from agriculture and urban activity, including industry; (3) inputs of P and N to agriculture in the form of fertilizers exceed outputs in produce in the United States and many other nations; (4) nutrient flows to aquatic ecosystems are directly related to animal stocking densities, and under high livestock densities, manure production exceeds the needs of crops to which the manure is applied; (5) excess fertilization and manure production cause a P surplus to accumulate in soil, some of which is transported to aquatic ecosystems; and (6) excess fertilization and manure production on agricultural lands create surplus N, which is mobile in many soils and often leaches to downstream aquatic ecosystems, and which can also volatilize to the atmosphere, redepositing elsewhere and eventually reaching aquatic ecosystems. If current practices continue, nonpoint pollution of surface waters is virtually certain to increase in the future. Such an outcome is not inevitable, however, because a number of technologies, land use practices, and conservation measures are capable of decreasing the flow of nonpoint P and N into surface waters. From our review of the available scientific information, we are confident that: (1) nonpoint pollution of surface waters with P and N could be reduced by reducing surplus nutrient flows in agricultural systems and processes, reducing agricultural and urban runoff by diverse methods, and reducing N emissions from fossil fuel burning; and (2) eutrophication can be reversed by decreasing input rates of P and N to aquatic ecosystems, but rates of recovery are highly variable among water bodies. Often, the eutrophic state is persistent, and recovery is slow.

Keywords: Agricultural, Agriculture, Algal Blooms, Aquatic, Aquatic Ecosystems, Atmosphere, Biodiversity, Bodies, Coastal, Conservation, Coral Reefs, Crops, Deposition, Ecosystems, Emissions, Enrichment, Estuaries, Estuary, Eutrophication, Fertilization, Fertilizers, Fish, Fish Kills, Flow, Fossil, Information, Lake, Lakes, Land Use, Land-Use, Literature, Livestock, Manure, Measure, Methods, Mobile, N, Nations, Needs, Nitrogen, Nonpoint, Nonpoint Pollution, North-Atlantic Ocean, Nutrient, Nutrients, Outcome, Oxygen, P, Phosphorus, Plant, Pollution, Practices, Quality, Rates, Recovery, Review, River, Rivers, Runoff, Scientific Information, Scientific Literature, Soil, Soils, Source, Sources, Species, State, Stream, Surface, Systems, Technologies, Toxic, Toxins, United States, Urban, Urban Runoff, Water, Waters, Weather, Wetlands

# Title: Ecological Economics

Full Journal Title: [Ecological Economics](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5995&_auth=y&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=7324f74c5399977d63d2efbf0431bcee)

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Language:

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Subject Categories:

: Impact Factor

Notes: highly cited

? Gorham, E. (1991), Northern peatlands: Role in the carbon cycle and probable responses to climatic warming. *Ecological Economics*, **1** (2), 182-195.

Full Text: [1991\Eco Eng1, 182.pdf](1991/Eco%20Eng1,%20182.pdf)

Abstract: Boreal and subarctic peatlands comprise a carbon pool of 455 Pg that has accumulated during the postglacial period at an average net rate of 0.096 Pg/yr (1 Pg = 10(15) g). Using Clymo’s (1984) model, the current rate is estimated at 0.076 Pg/yr. Long-term drainage of these peatlands is estimated to be causing the oxidation to CO2 of a little more than 0.0085 Pg/yr, with combustion of fuel peat adding almost-equal-to 0.026 Pg/yr. Emissions of CH4 are estimated to release almost-equal-to 0.046 Pg of carbon annually.

Uncertainties beset estimates of both stocks and fluxes, particularly with regard to Soviet peatlands. The influence of water table alterations upon fluxes of both CO2 and CH4 is in great need of investigation over a wide range of peatland environments, especially in regions where permafrost melting, thermokarst erosion, and the development of thaw lakes are likely results of climatic warming. The role of fire in the carbon cycle of peatlands also deserves increased attention. Finally, satellite-monitoring of the abundance of open water in the peatlands of the West Siberian Plain and the Hudson/James Bay Lowland is suggested as a likely method of detecting early effects of climatic warming upon boreal and subarctic peatlands.

Keywords: Biomass, Carbon Cycle, Carbon Dioxide, Climate Warming, Greenhouse Effect, Methane, Mires, Peatlands, Red Lake Peatland, Atmospheric Methane, Patterned Mires, Arctic Tundra, Soil-Nitrogen, Dioxide, Minnesota, Balance, Ecosystems, Landforms

? Costanza, R., Stern, D., Fisher, B., He, L.I. and Ma, C.B. (2004), Influential publications in ecological economics: A citation analysis. *Ecological Economics*, **50** (3-4), 261-292.

Full Text: [2004\Eco Eng50, 261.pdf](2004/Eco%20Eng50,%20261.pdf)

Abstract: We assessed the degree of influence of selected papers and books in ecological economics using citation analysis. We looked at both the internal influence of publications on the field of ecological economics and the external influence of those same publications on the broader academic community. We used four lists of papers and books for the analysis: (1) 92 papers nominated by the Ecological Economics (EE) Editorial Board; (2) 71 papers that were published in EE and that received 15 or more citations in all journals included in the Institute for Scientific Information (ISI) Citation Index; (3) 57 papers that had been cited in EE 15 or more times; and (4) 77 monographs and edited books that had been cited in EE 15 or more times. In all, we analyzed 251 unique publications. For each publication, we counted the total number of ISI citations as well as the total number of citations in EE. We calculated the average number of citations per year to each paper since its publication in both the ISI database and in EE, along with the percentage of the total ISI citations that were in EE.

Ranking the degree of influence of the publications can be done in several ways, including using the number of ISI citations, the number of EE citations or both. We discuss both the internal and external influence of publications and show how these influences might be considered jointly.

We display and analyze the results in several ways. By plotting the ISI citations against the EE citations, we can identify those papers that are mainly influential in EE with some broader influence, those that are mainly influential in the broader literature but have also had influence on EE and other patterns of influence. There are both overlaps and interesting lacunae among the four lists that give us a better picture of the real influence of publications in ecological economics vs. perceptions of those publications’ importance.

By plotting the number of citations vs. dates of publication, we can identify those publications that are projected to be most influential. Plots of the time series of citations over the 1990–2003 period show a generally increasing trend (contrary to what one would expect for an “average” paper) for the top papers. We suggest that this pattern of increasing citations (and thus influence) over time is one hallmark of a “foundational” paper. Data used in the analysis is available for download from the International Society for Ecological Economics (ISEE) web site to allow further analysis by interested readers.

Keywords: Ecological Economics, ISI, ISEE

? Ma, C.B. and Stern, D.I. (2006), Environmental and ecological economics: A citation analysis. *Ecological Economics*, **58** (3), 491-506.

Full Text: [2006\Eco Eng58, 491.pdf](2006/Eco%20Eng58,%20491.pdf)

Abstract: This study looks at two distinct questions: ‘What have been the most influential journal articles in environmental economics and ecological economics over the 10-year period 1994–2003?’; and ‘How much overlap is there between the fields of environmental and ecological economics?’ We examine the references in all articles published in *JEEM* and Ecological Economics (*EE*) over this period. For each of these two fields, a list of the top articles and top journals cited by articles published in *JEEM* and *EE* is presented. We also present some results based on our study of the ISI *Journal Citation Reports*. We find that there is a significant overlap between the two fields at the journal level — the two journals cite similar journals. There is a correlation of 0.34 between the number of citations received by the journals that are most cited and the correlation is even higher if journal self-citation is excluded. The main differences are that ecological economics tends to cite (but not be cited by) general natural science journals more often than environmental economics does, environmental economics cites more heavily from journals rather than other publications, and citations in environmental economics are more concentrated on particular journals and individual publications. However, there is much less similarity at the level of individual articles. Non-market valuation articles dominate the most cited articles in *JEEM* while green accounting, sustainability, and the environmental Kuznets curve are all prominent topics in *EE*.

Keywords: Bibliometrics, Citation, Citation Analysis, Citations, Departments, Ecological Economics, Environmental Economics, Goods, JEEM, Journal Articles, Journals, Publications, Quality, Rankings, Science, Science Journals, Trends, US

? Egoh, B., Rouget, M., Reyers, B., Knight, A.T., Cowling, R.M., van Jaarsveld, A.S. and Welz, A. (2007), Integrating ecosystem services into conservation assessments: A review. *Ecological Economics*, **63** (4), 714-721.

Full Text: 2007\Eco Eng63, 714.pdf

Abstract: A call has been made for conservation planners to include ecosystem services into their assessments of conservation priority areas. The need to develop an integrated approach to meeting different conservation objectives and a shift in focus towards human wellbeing are some of the motivations behind this call. There is currently no widely accepted approach to planning for ecosystem services. This study contributes towards the development of this approach through a review of conservation assessments and the extent to which they include ecosystem services. of the 476 conservation assessments identified by a set of search terms on the Web of Science, 100 were randomly selected for this review. of these only seven had included ecosystem services, while another 13 had referred to ecosystem services as a rationale for conservation without including them in the assessment. The majority of assessments were based on biodiversity pattern data while 19 used data on ecological processes. A total of 11 of these 19 assessments used processes, which could be linked to services. Ecosystem services have witnessed an increase in attention received in conservation assessments since the year 2000, however trends were not apparent beyond this date. In order to assess which types of ecosystem services and how they have been accounted for in conservation assessments, we extended our review to include an additional nine conservation assessments which included ecosystem services. The majority included cultural ecosystem services, followed by regulatory, provisioning and supporting services respectively. We conclude with an analysis of the constraints and opportunities for the integration of ecosystem services into conservation assessments and highlight the urgent need for an appropriate framework for planning for ecosystem services. (C) 2007 Elsevier B.V. All rights reserved.

Keywords: Analysis, Area Selection, Assessment, Attention, Biodiversity, Biodiversity Conservation, Biodiversity Conservation, Cape Floristic Region, Conservation Planning, Development, Ecological Processes, Ecosystem Functions, Ecosystem Services, Human, Identifying Priority Areas, Land-Use, Landscape, Linking Biodiversity, Priority Areas, Real-World, Reserves, Review, Science, Selection, South-Africa, Trends, Web of Science

? Silva, M.C.E. and Teixeira, A.A.C. (2011), A bibliometric account of the evolution of EE in the last two decades is ecological economics (becoming) a post-normal science? *Ecological Economics*, **70** (5), 849-862.

Full Text: [2011\Eco Eng70, 849.pdf](2011/Eco%20Eng70,%20849.pdf)

Abstract: In ecological economics the debate on formalism and formalization has been addressed in the context of a lively discussion on ecological economics as a ‘post-normal’ (versus ‘normal’) science. Using ecological economics (EE) as a ‘seed’ journal and applying bibliometric techniques to all (2533) the articles published in EE from January 1989 to December 2009, we analyze the evolution of the field of ecological economics aiming to shed light on this debate. We observe the predominance (and increased relevance) of certain research topics: ‘Methodological issues’, ‘Policies, governance and institutions’ and ‘Valuation’. Moreover, ‘Collective action’, ‘Technical change and the environment’ and ‘Values’ stand as emergent themes of research. Finally, we note that ecological economics experienced an ‘empirical turn’ reflected in a shift away from exclusively formalized papers towards exclusively empirical and, to a larger extent, ‘formal and empirical’ ones. The combination of the prominent and emergent topics and the ‘empirical turn’ mirrors the increasing awareness among researchers in the field of the need to address a key specificity of ecological economics - the interdependence of the economic, biophysical and social spheres. On this basis, we argue that at least through the lens of EE, ecological economics has evolved towards a post-normal science. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Attention, Behavior, Bibliometric, Bibliometric Techniques, Bibliometrics, Biodiversity, Consumption, Context, Dynamics, Ecological Economics, Economic, Economics, Environment, Environmental-Policy, Evolution, Field, Governance, Institutions, Irreversibility, Journal, Key Issues, Mar, Methodology, Normal, Papers, Perspective, Post-Normal Science, Relevance, Research, Research Trends, Rights, Science, Social, Specificity, Spheres, Sustainability, Techniques, Valuation

# Title: Ecological Engineering

Full Journal Title: [Ecological Engineering](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6006&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=90145fce3d9378358087c6bd570f5f25)

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Environmental Sciences: Impact Factor 1.836, 64/163 (2008); Impact Factor 2.745, 34/180 (2009)

Sharma, S.S. and Gaur, J.P. (1995), Potential of *Lemna-polyrrhiza* for removal of heavy-metals. *Ecological Engineering*, **4** (1), 37-43.

Full Text: [E\Eco Eng4, 37.pdf](E/Eco%20Eng4,%2037.pdf)

Abstract: *Lemna polyrrhiza* (*Spirodela polyrhiza*) (duckweed) exposed to 10 mg l-1 of Zn, Pb and Ni for four days accumulated 27.0, 10.0 and 5.5 µg mg-1 of Zn, Pb and Ni, respectively. Zinc accumulation in Lemna was greater than in any other organism thus far studied. Metal uptake occurred rapidly for 12 h, and then plateaued. Rootless test plants exhibited lower uptake of Zn and Ni. Darkness inhibited metal uptake. Metals reduced chlorophyll in the following order: Zn > Pb > Ni. Substantial losses of Ca, Mg and K occurred from test plants exposed to metals, Zn was the most effective. Greater toxicity of Zn to Lemna appears to be related to the high amount of accumulated Zn.

Keywords: Accumulation, Duckweed, Heavy Metals, Lemna Polyrrhiza, Cadmium, Zinc, Plants, Accumulation, Culture, Mercury, Corn

Mehta, S.K. and Gaur, J.P. (2001), Characterization and optimization of Ni and Cu sorption from aqueous solution by *Chlorella vulgaris*. *Ecological Engineering*, **18** (1), 1-13.

Full Text: [E\Eco Eng18, 1.pdf](E/Eco%20Eng18,%201.pdf)

Abstract: Sorption of Ni and Cu by *Chlorella vulgaris* showed the second-order rate kinetics. Change in biomass concentration altered the kinetic parameters of sorption. When biomass concentration was increased from 5 to 1000 mg 1-1, the initial rates of sorption of Ni and Cu were reduced by about five- and three-times, respectively. The metal sorption capacity of the test alga was studied taking different concentrations of Ni and Cu at different biomass concentrations as well as different pH. The sorption of test metals fitted better in Freundlich than the Langmuir model thereby indicating multi-layer adsorption of Ni and Cu onto *C. Vulgaris*. The Kf and Qmax both decreased with increase in biomass concentration thereby suggesting that the metal sorption capacity of the test alga was impaired at higher biomass concentrations. The maximum sorption of Ni and Cu occurred at pH 5.5 and 3.5, respectively. Heat-killed cells showed a greater potential of metal sorption than the live cells. The test alga was subjected to different pre-treatments to enhance its metal sorption capacity, acid (HCl and HNO3) pre-treatments were most effective. The maximal removal of Ni and Cu, 93 and 96%, respectively, occurred from solutions having their 2.5 mg 1-1 concentration. Thus *C. Vulgaris* has a great potential for removing Ni and Cu especially when concentrations of these metals are low in the external environment. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Chlorella, Isotherm, Kinetics, Sorption, Cu, Ni, Metal Removal, Heavy-Metal Biosorption, *Rhizopus-arrhizus*, By-Products, Cell-Walls, Adsorption, Ions, pH, Yeast

? Mitsch, W.J. and Jørgensen, S.E. (2003), Ecological engineering: A field whose time has come. *Ecological Engineering*, **20** (5), 363-377.

Full Text: [2003\Eco Eng20, 363.pdf](2003/Eco%20Eng20,%20363.pdf)

Abstract: Ecological engineering is defined as “the design of sustainable ecosystems that integrate human society with its natural environment for the benefit of both.” It involves the restoration of ecosystems that have been substantially disturbed by human activities such as environmental pollution or land disturbance; and the development of new sustainable ecosystems that have both human and ecological value. While there was some early discussion of ecological engineering in the 1960s, its development was spawned later by several factors, including loss of confidence in the view that all pollution problems can be solved through technological means and the realization that with technological means, pollutants are just being moved from one form to another. Conventional approaches require massive amounts of resources to solve these problems, and that in turn perpetuates carbon and nitrogen cycle problems, for example. The development of ecological engineering was given strong impetus in the last decade with a textbook, the journal Ecological Engineering and two professional ecological engineering societies. Five principles about ecological engineering are: (1) It is based on the self-designing capacity of ecosystems; (2) It can be the acid test of ecological theories; (3) It relies on system approaches; (4) It conserves non-renewable energy sources; and (5) It supports biological conservation. Ecology as a science is not routinely integrated into engineering curricula, even in environmental engineering programs, while shortcoming, ecologists, environmental scientists, and managers miss important training in their profession—problem solving. These two problems could be solved in the integrated field of ecological engineering. © 2003 Elsevier B.V. All rights reserved.

Keywords: Ecotechnology, Self-Design, Self-Organization, Ecological Conservation

? Mitsch, W.J., Tejada, J., Nahlik, A., Kohlmann, B., Bernal, B. and Hernández, C.E. (2008), Tropical wetlands for climate change research, water quality management and conservation education on a university campus in Costa Rica. *Ecological Engineering*, **34** (4), 276-288.

Full Text: [2008\Eco Eng34, 276.pdf](2008/Eco%20Eng34,%20276.pdf)

Abstract: Earth University is a small agronomic university with a theme of sustainability in eastern Costa Rica. Several natural and constructed wetlands on its campus are used for research, water quality improvement, and higher education. It has become an important location for research and teaching on humid tropical wetland ecology and management. A 112-ha flow-through Raphia taedigera (Arecaceae) forested wetland is being used for climate change research, focusing on carbon sequestration and methane generation. Methane emissions are measured seasonally and are comparable to rates in tropical wetlands published elsewhere. Carbon sequestration by the wetland appears to be substantially higher than similar flow-through temperate zone wetlands. Treatment wetlands are used on campus to improve water quality of effluents from an animal farm, a dairy plant, a landfill, and a banana paper plant. Water quality was substantially improved in all of these wetlands except the landfill leachate wetland. All of these campus wetlands have been integrated into the four-year education program of EARTH University and 22 undergraduate projects have been completed on wetlands over the past 14 years.

Keywords: Tropical Wetlands, Treatment Wetlands, Climate Change, Methane, Carbon Sequestration, Wetland Education

? Hanif, A., Bhatti, H.N. and Hanif, M.A. (2009), Removal and recovery of Cu(II) and Zn(II) using immobilized *Mentha arvensis* distillation waste biomass. *Ecological Engineering*, **35** (10), 1427-1434.

Full Text: [2009\Eco Eng35, 1427.pdf](2009/Eco%20Eng35,%201427.pdf)

Abstract: The potential use of the immobilized Mentha arvensis distillation waste (IMADW) biomass for removal and recovery of Cu(II)and Zn(II) from aqueous was evaluated in the present study. Biosorption capacity of Cu(II) and Zn(II) on IMADW increased with increase in pH reaching a maximum at 5 for Cu(II) and 6 for Zn(II). The equilibrium sorption data agreed well with Langmuir isotherm model and pseudo-second-order kinetic model in batch mode. Cu(II) and Zn(II) uptake by IMADW was best described by pseudo-first-order kinetic model in continuous mode. Maximum Cu(II) and Zn(II) uptake by IMADW was 104.48 and 107.75 mg/g, respectively. Fourier Transform Infrared spectroscopy (FTIR) and scanning electron microscopy (SEM) were also carried out to investigate functional groups and surface changes of biomass. The results showed that IMADW biomass is a potential biomaterial to remove Cu(II) and Zn(II) ions with a high biosorption capacity from aqueous solutions. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Aqueous Solutions, Aqueous-Solutions, Batch, Batch Mode, Biomass, Biosorption, Capacity, Changes, Chlorrela-Vulgaris, Copper, Cr(VI), Cu(II), Data, Electron Microscopy, Equilibrium, FTIR, Functional Groups, Golden Shower Biomass, Heavy-Metals, Immobilization, Immobilized, Ions, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Mentha Arvensis, Mode, Model, Ni(II) Biosorption, Pb(II), pH, Potential, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Recovery, Removal, Rights, Scanning Electron Microscopy, SEM, Solutions, Sorption, Spectroscopy, Surface, Uptake, Waste, Waste Biomass, Zn(II), Zn(II) Ions

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Full Text: [2009\Eco Eng-Ho.pdf](2009/Eco%20Eng-Ho.pdf), [2010\Eco Eng-Ho.pdf](2010/Eco%20Eng-Ho.pdf); [2010\Eco Eng36, 832.pdf](2010/Eco%20Eng36,%20832.pdf)

? Zhang, L., Wang, M.H., Hu, J. and Ho, Y.S. (2010), A review of published wetland research, 1991-2008: Ecological engineering and ecosystem restoration. *Ecological Engineering*, **36** (8), 973-980.

Full Text: [2010\Eco Eng-Zhang.pdf](2010/Eco%20Eng-Zhang.pdf); [2010\Eco Eng-Zhang-1.pdf](2010/Eco%20Eng-Zhang-1.pdf); [2010\Eco Eng36, 973.pdf](2010/Eco%20Eng36,%20973.pdf)

Abstract: An effective bibliometric analysis based on the Science Citation Index (SCI) published by the Institute of Scientific Information (ISI) was carried out to identify wetland research between 1991 and 2008. The objective was to conduct a quantitative and qualitative analysis for global trends of wetland-related research. The characteristics related to publications were analyzed. The results showed the significant wetland research issues in the SCI database. From 1991 to 2008, the annual number of journal articles published and the number of articles cited to wetland research increased more than sixfold and ninefold respectively. The USA produced the most single-country articles and international collaborative articles, followed by Canada and UK. The results also showed the significant wetland research issues in SCI database. The most frequently used words were: “water” (or “water quality”), which ranked 3rd, 7th, and 3rd according to the word in article title, author keyword, and keyword plus analysis, respectively. Constructed wetland biodiversity became more active in wetland research. The keywords “constructed wetland” and “constructed wetlands” ranked 58th and 12th in 1991–1996, while they ranked 5th and 4th in 2003–2008; the author keyword “biodiversity” ranked 45th in 1991–1996, while it ranked 23rd in 1997–2002, and 14th in 2003–2008; and keyword plus “diversity” ranked 93rd in 1991–1996, while it ranked 20th in 1997–2002, and 17th in 2003–2008. Moreover, it was proved that article title, author keyword, and keyword plus analysis methods were effective approaches for mapping wetland research. Popular wetland research issues and wetland research changes were also identified by statistical analysis.

Keywords: Author Keyword, Bibliometric Analysis, Bulrush Scirpus-Validus, Conservation, Constructed Wetland, Integrated Constructed Wetlands, Management, Performance, Pollution-Control, Removal, Research, Research Trend, Waste-Water, Water Quality, Water-Quality, Web of Science

? Tan, C.Y., Li, G., Lu, X.Q. and Chen, Z.L. (2010), Biosorption of basic orange using dried A. filiculoides. *Ecological Engineering*, **36** (10), 1333-1340.

Full Text: [2010\Eco Eng36, 1333.pdf](2010/Eco%20Eng36,%201333.pdf)

Abstract: In older to understand the biosorption of Basic Organic (BO) textile dye on dried Azolla filiculoides (A filiculoides). batch experiments were conducted under various conditions The results show that biosorpnon of BO on dried A filiculoides was dependent on the initial solution pH, biosorbent dosage, contact time and the initial BO concentration. Using the Langmuir equation, the biosorption capacity (q(m)) for BO was 833 mg/g at 303K. The kinetic study suggested that the mechanism of biosorption was clue to ion-exchange physisorption via the Hula-particle diffusion and chemisorption on the external surface of dried A. filiculoides Different techniques were used to characterize dried A filiculoides and indicated that the biomass had a high cation exchange capacity (93.6 mmol/100 g). a large specific surface area (80.35-422 89 m2/g) and contained various functional groups which may play an important role in the physisorption and chemisorption of BO on the surface of A. filiculoides The results showed that the removal ratio of BO reached 79.3% from wastewater containing 100 mg/L BO, indicating that the biomass could be used as a potential biosorbent for the removal of BO from industrial wastewater (C) 2010 Elsevier B V All rights reserved.

Keywords: Aqueous-Solutions, Azolla Filiculoides, Azolla-Filiculoides, Basic Orange, Batch, Batch Experiments, Biomass, Biosorbent, Biosorption, Capacity, Cation, Cation Exchange, Characterization, Chemisorption, Color Removal, Concentration, Diffusion, Dye, Equilibrium, Experiments, Functional Groups, Industrial Wastewater, Ion Exchange, Ion-Exchange, Ionexchange, Kinetic, Kinetic Study, Kinetics, Langmuir, Langmuir Equation, Mechanism, Methylene-Blue Adsorption, pH, Potential, Reactive Dyes, Removal, Rights, Role, Solution, Specific Surface, Specific Surface Area, Surface, Surface Area, Techniques, Textile Dye, Waste-Water, Wastewater

? Asgher, M. and Bhatti, H.N. (2010), Mechanistic and kinetic evaluation of biosorption of reactive azo dyes by free, immobilized and chemically treated *Citrus sinensis* waste biomass. *Ecological Engineering*, **36** (12), 1660-1665.

Full Text: [2010\Eco Eng36, 1660.pdf](2010/Eco%20Eng36,%201660.pdf)

Abstract: Sorption potential of Citrus sinensis biomass for reactive yellow 42 and reactive red 45 was investigated with variation of pH, biosorbent dose and dye concentration. Biosorbent was treated by organic and inorganic reagents of which acetic acid and acetonitrile enhanced the sorption capacities for reactive yellow 42 and reactive red 45, respectively. Sorption equilibrium was established within 60 min using free and chemically treated biosorbent, while prolonged to 120 min using immobilized biosorbent. Freundlich isotherm and pseudo-second-order rate law described best the sorption mechanism. FT-IR analysis of biosorbent revealed the presence of C=O, C-O, NH and OH groups on the surface of biosorbent. Desorption experiments were performed to regenerate the sorbent, making the process more economical and environment friendly. (C) 2010 Elsevier B.V. All rights reserved.

Keywords: Acetic Acid, Analysis, Aqueous-Solutions, Biomass, Biosorbent, Biosorption, Citrus Sinensis, Co, Design, Desorption, Dye, Dyes, Environment, Equilibrium, Equilibrium Modeling, Evaluation, Freundlich, Freundlich Isotherm, FT-IR, FTIR, Isotherm, Kinetic, Kinetic Study, Malachite Green, Methylene-Blue Biosorption, pH, Process, Pseudo Second Order, Pseudo-Second-Order, Reactive Azo Dyes, Removal, Rice Husk, Sorbent, Sorption, Sorption Mechanism, Textile Wastewaters, Yellow Passion-Fruit

? Kurniawan, A., Sisnandy, V.O.A., Trilestari, K., Sunarso, J., Indraswati, N. and Ismadji, S. (2011), Performance of durian shell waste as high capacity biosorbent for Cr(VI) removal from synthetic wastewater. *Ecological Engineering*, **37** (6), 940-947.

Full Text: [2011\Eco Eng37, 940.pdf](2011/Eco%20Eng37,%20940.pdf)

Abstract: The capability of durian shell waste biomass as a novel and potential biosorbent for Cr(VI) removal from synthetic wastewater was studied. The adsorption study was performed in batch mode at different temperatures and pH. Langmuir and Freundlich isotherm models fit the equilibrium data very well (R(2) > 0.99). The maximum biosorption capacity of durian shell was 117 mg/g. On modeling its kinetic experimental data, the pseudo-first order prevails over the pseudo-second order model. Thermodynamically, the characteristic of Cr-biosorption process onto durian shell surface was spontaneous, irreversible and endothermic. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Adsorbents, Adsorption, Agricultural Waste, Aqueous-Solution, Aspergillus-Niger, Biomass, Biosorbent, Biosorption, Biosorption, Chromium, Durian Shell, Equilibrium, Fungal Biomass, Hexavalent Chromium, Model, Performance, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Recovery

? Huang, L.D., Fu, L.L., Jin, C.W., Gielen, G., Lin, X.Y., Wang, H.L. and Zhang, Y.S. (2011), Effect of temperature on phosphorus sorption to sediments from shallow eutrophic lakes. *Ecological Engineering*, **37** (10), 1515-1522.

Full Text: [2011\Eco Eng37, 1515.pdf](2011/Eco%20Eng37,%201515.pdf)

Abstract: The availability of phosphorus (P) in lakes is dependent on the sorption characteristics of the underlying sediments. Temperature is a crucial factor affecting the P sorption in sediments. The objective of this study was to evaluate the effect of temperature on sorption of P by sediments from two eutrophic lakes. The study was carried out using short-term batch experiments at 4, 20 and 30ºC. Phosphorus sorption kinetics, isotherms, fractionation and desorption were investigated. The P sorption was dependent on sediment type and temperature (p < 0.001). The Mei sediments showed a higher sorption rate and sorption capacity than Hua sediments. The P sorption kinetics were best described by a pseudo second order model (R2 > 0.97). Activation energies derived from the kinetics rate constant indicated that P sorption onto the two sediments was controlled by a diffusion process. For both sediments. Freundlich model fit the P sorption isotherms well and the calculated apparent sorption heat was 6.37 kJ mol-1 for Mei sediments and 8.67 kJ mol-1 for Hua sediments. This indicated that P sorption onto both sediments was endothermic. Adding P significantly increased the soluble and loosely bound P (S/L-P), aluminum-bound P (Al-P) and iron-bound P (Fe-P) (p < 0.05). The amount of Al-P and Fe-P was markedly higher at 30ºC than at 4ºC (p < 0.05). Subsequent P desorption indicated that adsorbed P was highly labile, in particular for Hua sediment. The degree of P mobility that occurred during sediment sorption was inversely related to the temperature at the time of sorption. A significant relationship (R2 = 0.978) between phosphorus sorption maximum and oxalate-extractable Fe and Al at different temperatures reflects that the amorphous contents of Fe and Al are responsible for the temperature effect on P sorption. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Bioavailability, China, Desorption, Diffusion, Fractionation, Fractions, Freundlich, Isotherms, Kinetics, Organic-Matter, Phosphate Adsorption, Phosphorus, Resuspension, Retention Capacity, Sediment, Soil, Sorption, Sorption Isotherms, Sorption Kinetics, Temperature, Water Interface

# Title: Ecological Informatics

Full Journal Title: Ecological Informatics

ISO Abbreviated Title:

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? Li, J. and Heap, A.D. (2011), A review of comparative studies of spatial interpolation methods in environmental sciences: Performance and impact factors. *Ecological Informatics*, **6** (3-4), 228-241.

Full Text: [2011\Eco Inf6, 228.pdf](2011/Eco%20Inf6,%20228.pdf)

Abstract: Spatial interpolation methods have been applied to many disciplines. Many factors affect the performance of the methods, but there are no consistent findings about their effects. In this study, we use comparative studies in environmental sciences to assess the performance and to quantify the impacts of data properties on the performance. Two new measures are proposed to compare the performance of the methods applied to variables with different units/scales. A total of 53 comparative studies were assessed and the performance of 72 methods/sub-methods compared is analysed. The impacts of sample density, data variation and sampling design on the estimations of 32 methods are quantified using data derived from their application to 80 variables. Inverse distance weighting (IDW), ordinary kriging (OK), and ordinary co-kriging (OCR) are the most frequently used methods. Data variation is a dominant impact factor and has significant effects on the performance of the methods. As the variation increases, the accuracy of all methods decreases and the magnitude of decrease is method dependent. Irregular-spaced sampling design might improve the accuracy of estimation. The effect of sampling density on the performance of the methods is found not to be significant. The implications of these findings are discussed. Crown Copyright (C) 2010 Published by Elsevier B.V. All rights reserved.

Keywords: Spatial Interpolator, Geostatistics, Kriging, Data Variation, Sample Density, Soil Properties, Geostatistical Analysis, Prediction Methods, Snow Distribution, Air-Temperature, Kriging Methods, External Drift, Point Data, Regression, Precipitation

# Title: Ecological Modelling

Full Journal Title: [Ecological Modelling](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5934&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=ed1895a8f414bf77ae379d4e91b180c3)

ISO Abbreviated Title: Ecol. Model.

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Journal Country/Territory: Netherlands

Language: English

Publisher: Elsevier Science BV

Publisher Address: PO Box 211, 1000 AE Amsterdam, Netherlands

Subject Categories:

Ecology: Impact Factor

Amacher, M.C. and Selim, H.M. (1994), Mathematical-models to evaluate retention and transport of chromium(VI) in soil. *Ecological Modelling*, **74** (3-4), 205-230.

Full Text: [E\Eco Mod74, 205.pdf](E/Eco%20Mod74,%20205.pdf)

Abstract: Modeling the transport of reactive heavy metals in soils requires a mathematical description of the kinetics of various sorption processes. A family of models has been developed that can potentially describe the retention and transport of heavy metals in soils. These models include MRM (a multireaction model applicable to batch studies that includes parallel, reversible, nonlinear kinetic and equilibrium retention reactions), MRTM (MRM incorporated into the convection-dispersion equation for solute transport in soils under steady-state water flow) and SOTS (a two-site model applicable to batch and column studies that includes two parallel, reversible, second-order kinetic retention reactions). All the models include an irreversible, first-order kinetic reaction. Batch kinetic and column transport studies were conducted to evaluate the ability of these models to describe the retention and transport of Cr(VI) in three soils. Both MRM and SOTS described kinetic Cr(VI) retention data from batch experiments equally well. However, MRM rate coefficients from batch experiments could not be used to predict Cr(VI) breakthrough curves (BTCs) from column transport experiments when the soil retained a significant amount of solute. This was because MRM rate coefficients were pseudo rate coefficients that varied with initial solute concentration. SOTS rate coefficients from batch experiments could be used to approximate BTCs for Cr(VI). The second-order kinetic model, which accounts for the concentrations of reaction sites in soils, is a more realistic description of apparent retention processes. However, differences in mass transfer processes between batch and column studies will continue to limit the usefulness of batch-derived rate coefficients in predicting transport of reactive solutes in soils.

Keywords: Adsorption Desorption, Chromate Adsorption, Hexavalent Forms, Kinetics, Goethite, Reduction, Behavior

Bakema, A.H., Deboer, K.F., Braat, L.C., Kok, R.M., Meijers, R. and Vanminnen, J.G. (1994), Expect: A concise simulation system for environmental-policy analysis. *Ecological Modelling*, **75-76**, 553-561.

Full Text: [E\Eco Mod75, 553.pdf](E/Eco%20Mod75,%20553.pdf)

Abstract: In 1988 and 1991 the first Dutch National Environmental Outlooks were produced at the National Institute of Public Health and Environmental Protection (RIVM), evaluating the present state of the environment in the Netherlands and the expected changes in the next 20 years. For this purpose, many sources of data and many different simulation models were used. Often one model would generate part of the input data for another model. To complete all calculations in the chain of models and reliably arrange the data transfer between them required a period of approximately 2 months. Evaluation of more than a few policy scenarios was therefore practically impossible. Also, an uncertainty analysis of the total system of models used in the process was something only to be dreamt of. This led to the view that a tool was needed for fast evaluation of a great number of scenarios. This would also allow uncertainty analyses of the whole modelling system and the search for optimal solutions. The EXPECT modelling system is designed to provide such a tool. It couples concise models which were derived from the detailed process models used in the National Environmental Outlooks. At present the system provides the possibility to evaluate environmental policy scenarios for their effect on acid deposition, soil acidification, forest growth and overfertilization of heath vegetations. It is being extended to include surface water and groundwater quality models. The system includes a user interface that greatly facilitates scenario composition and interpretation of results.

Keywords: Environmental Policy, Expect

# Title: Ecological Monographs

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Notes: highly cited

? Clark, D.A. and Clark, D.B. (1992), Life-history diversity of canopy and emergent trees in a neotropical rain-forest. *Ecological Monographs*, **62** (3), 315-344.

Full Text: [1992\Eco Mon62, 315.pdf](1992/Eco%20Mon62,%20315.pdf)

Abstract: To assess the diversity of tropical tree life histories, a conceptual framework is needed to guide quantitative comparative study of many species. We propose one such framework, which focuses on long-term performance through ontogeny and over the natural range of microsites. For 6 yr we annually evaluated survival, growth, and microsite conditions of six non-pioneer tree species in primary tropical wet forest at the La Selva Biological Station, Costa Rica. The species were: Lecythis ampla, Hymenolobium mesoamericanum, Dipteryx panamensis, Pithecellobium elegans, Hyeronima alchorneoides (all emergents), and Minquartia guianensis (a canopy species). The study was based on long-term measurement of individuals from all post-seedling size classes. Trees were sampled from 150 ha of primary forest spanning several watersheds and soil types. To evaluate individuals’ microsites we recorded the number of overtopping crowns, forest phase (gap, building, mature), and crown illumination index (an estimate of the tree’s light environment). For comparison, we also evaluated the microsites of three species that have been categorized as pioneers (Cecropia insignis, C obtusifolia) or high-light demanders (Simarouba amara). For the six species of non-pioneers, mortality rates declined with increasing juvenile size class. As a group, these emergent and canopy trees showed a much lower exponential annual mortality rate (0.44%/yr at > 10 cm diameter) than has been found for the La Selva forest as a whole. Growth rates increased with juvenile size class for all six species. As adults (trees > 30 cm in diameter), all five emergent species showed substantial annual diameter increments (medians of 5-14 mm/yr). Small saplings and adults of all species had significant year-to-year variation in diameter growth, with much greater growth occurring in the year of lowest rainfall. Passage time analysis suggests that all six species require > 150 yr for growth from small saplings to the canopy. Evaluation of all nine species revealed four patterns of microsite occupancy by juveniles. Among the non-pioneers, one species pair (Lecythis and Minquartia: Group A) was associated with low crown illumination and mature-phase forest in all juvenile stages. For two species (Dipteryx and Hymenolobium: Group B) the smallest saplings were in predominantly low-light, mature-forest sites, but crown illumination and association with gap- or building-phase sites increased with juvenile size (Simarouba also showed this pattern). Two species (Pithecellobium and Hyeronima: Group C) were strongly associated with gap or building phase as small juveniles (less-than-or-equal-to 4 cm diameter) and again as subcanopy trees (> 10 - 20 cm diameter), but were predominantly in mature-phase sites at intermediate sizes. Juveniles of the two pioneer species (Cecropia: Group D) showed the highest crown illumination and association with gap or building sites. Among the six non-pioneer species, only one aspect of juvenile performance clearly varied according to microsite group. The smallest saplings (less-than-or-equal-to 1 cm diameter) of Groups B and C showed significant mortality differences across a small gradient in crown illumination; neither of the Group A species showed this pattern. Otherwise, juvenile performance was strikingly similar among the six species. All showed a capacity for growth responses to small increases in light, substantial height and diameter increments at higher light levels, equal ability to survive 4-yr periods of no growth, and very low mortality rates at intermediate-to-large juvenile sizes. Species differed significantly in growth rates, but relative differences shifted with tree size and were unrelated to microsite group. These findings do not support prevailing paradigms concerning trade-offs and correlated suites of traits. For non-pioneer tropical trees, life history classification based on generalized concepts such as gap dependence and shade tolerance is inadequate to describe the complex size-dependent patterns of life history differences and similarities that exist among species.

Keywords: Costa-Rica, Demography, Dipteryx-Panamensis, Diversity, Dynamics, Emergent, Environment, Evaluation, Forest Ecology, Gap Dependence, Gaps, History, Life History, Light Environments, Measurement, Old-Growth Forest, Panama, Pioneer Species, Primary, Regeneration, Seed Dispersal, Shade Tolerance, Species-Diversity, Treefall Gaps, Tropical Rain Forest, Tropical Trees, Tropical Wet Forest

# Title: Ecology

Full Journal Title: [Ecology](http://www.esajournals.org/loi/ecol)

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Subject Categories:

: Impact Factor

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Full Text: [-1959\Ecology5, 175.pdf](-1959/Ecology5,%20175.pdf)

Notes: highly cited

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Full Text: [1992\Ecology73, 1045.pdf](1992/Ecology73,%201045.pdf)

Abstract: A method is proposed to partition the variation of species abundance data into independent components: pure spatial, pure environmental, spatial component of environmental influence, and undetermined. The new method uses pre-existing techniques and computer programs of canonical ordination. The intrinsic spatial component of community structure is partialled out of the species-environment relationship in order to see if the environmental control model still holds. The method is illustrated using oribatid mites in a peat blanket, forest vegetation data, and aquatic heterotrophic bacteria. In this latter example, the new method is shown to be complementary to another approach based on partial Mantel tests.

Keywords: Canonical Correspondence Analysis, Community Structure, Constrained Ordination, Environmental Control Model, Forest Vegetation, Heterotrophic Bacteria, Modeling Ecological Relationships, Orbatid Mites, Partial Canonical Ordination, Redundancy Analysis, Spatial Analysis, Variation Partitioning, Canonical Correspondence-Analysis, Interspecific Competition, Environment Relationships, Field Experiments, Succession, Zooplankton, Forest, Lake, Fish

Notes: highly cited

? Bridgham, S.D., Updegraff, K. and Pastor, J. (1998), Carbon, nitrogen, and phosphorus mineralization in northern wetlands. *Ecology*, **79** (5), 1545-1561.

Full Text: [1998\Ecology79, 1545.pdf](1998/Ecology79,%201545.pdf)

Abstract: We examined rates of C, N, and P mineralization in soils from 16 northern Minnesota wetlands that occur across an ombrotrophic-minerotrophic gradient. Soils were incubated at 30 degrees C under aerobic and anaerobic conditions for 59 wk, and the results were fit with a two-pool kinetic model. Additionally, 39 different soil quality variables were used in a principal components analysis (PCA) to predict mineralization rates. Mineralization of C, N, and P differed significantly among wetland types, aeration status (aerobic vs. anaerobic), and their interaction term. Despite low total soil N and P, there was a rapid turnover of the nutrient pools in ombrotrophic sites, particularly under aerobic conditions. On a volumetric basis, C and N mineralization increased in a predictable manner across the ombrotrophic-minerotrophic gradient, largely due to increasing soil bulk density. However, P mineralization per cubic centimeter remained relatively high in the bogs. The higher total P content of more minerotrophic soils appears to be offset by greater P immobilization due to geochemical sorption, yielding overall lower availability. Total C turnover rates were relatively similar among sites, despite large differences in soil quality. We suggest that, over time, the decay rates of organic matter in different wetland communities converge to a common rate. In contrast, CH4 production was extremely low in ombrotrophic pests. The apparent labile pools of N (N-0), P (P-0), and C (C-0) were generally <10% of their respective total pool sizes, except for P-0 in the bogs, which constituted up to 33% of total soil P. From 10% to 87% of the N, P, and C mineralized after 59 wk was derived from their respective labile pools. A simple group of variables describing the physical degree of decomposition of organic matter was often as good as, or superior to, more complicated chemical analyses in predicting C, N, and P mineralization. Because pears are classified and mapped according to these variables, it should make scaling efforts in landscape analyses much more tractable. Large differences in mineralization rates in northern wetland communities demonstrate that climate change models should not consider these areas as homogeneous entities. Our C mineralization results suggest that soil respiratory response to climate change (as CO2 and CH4) will vary considerably in different wetland communities. Our results also suggest that the common perception that more ombrotrophic sites are inherently more nutrient deficient needs to be reassessed.

Keywords: Availability, Boreal, Carbon, Co2, Decomposition, Dynamics, Fresh-Water Wetlands, Interaction, Mechanisms, Methane, Methane Emissions, Mineralization, Nitrification, Nitrogen, Ombrotrophic-Minerotrophic Gradient, Peatlands, Peatlands, Phosphorus, Plant Litter, Redox Status, Soil Quality, Soils, Sorption, Temperature, Wetlands

# Title: Ecology and Environment

Full Journal Title: [Ecology and Environment](http://www.ceps.com.tw/ec/ecJnlIntro.aspx?jnlcattype=1&jnlptype=4&jnltype=39&Jnliid=2888&newIssueiid=43465)

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Subject Categories:

: Impact Factor

? Liu, J.J., Chen, L.J., Wen, D.H., He, Y.S., Qiao, L., Xia, M. and Li, Y. (2006), Biodegradation of pyridine in the slurry system. *Ecology and Environment*, **15** (6), 1180-1184.

Full Text: [2006\Eco Env15, 1180.pdf](2006/Eco%20Env15,%201180.pdf)

Abstract: The pollution of soil and underground water caused by nitrogen heterocyclic aromatics are increasingly serious nowadays. Bioremediation seems a promising solution to this problem. A bacteria strain W12, which could utilize pyridine as the sole carbon source and nitrogen source, was isolated from the active sludge in a lab bioreactor, and identified as species of Paracoccus denitrificans. In this study, we applied this strain in the slurry bioremediation in which the soil was simulated as polluted by pyridine. Under the experimental conditions, the adsorption of pyridine onto the soil was very weak, but fitting the Freundlich isotherm. When the initial concentration of pyridine was 1.65mg g-1, the inoculated strain could degrade the pyridine thoroughly within 12h and 18h in the sterilized soil and natural soil, respectively. It showed that the pyridine degradation efficiency by the strain W12 was depressed by the soil indigenous microbes because of food limitation. In addition, the influence of the delivering amount of the strain W12 as well as the external nitrogen resources and the soil-water-ratio of the slurry were studied. It showed that the delivering amount was an important factor to influence the biodegradation of pyridine in the slurry, while the external nitrogen resources and the soil-water-ratio had little effects on the biodegradation.

Keywords: Paracoccus Denitrificans, Biodegradation, Pyridine, Bioremediation, Slurry

# Title: Ecology and Environmental Sciences

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ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

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Journal Country/Territory:

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Publisher:

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Subject Categories:

: Impact Factor

? Zhang, B, Qu, J.S. and Wang, J.P. (2011), A bibliometrical analysis of competitive situation in international ecological research. *Ecology and Environmental Sciences*, **20** (4), 786-792.

Full Text: [2011\Eco Env Sci20, 786.pdf](2011/Eco%20Env%20Sci20,%20786.pdf)

Abstract: Nowadays, ecological and environmental problems have attracted much attention of governments and people, because ecological research can provide the theoretical basis and guideline for the coexistence between humans and the natural ecosystem. In this paper, analytical tools such as Thomson Data Analyzer, NetDraw and Aureka in combined with “pathfinder” algorithm were used to analyze the data of ecological research in the SCIE and SSCI databases. We find that the papers of the Northern America, Europe, Australia and their institutions have stronger impact on international ecological research and their quality is better. Meanwhile, the United States is the international center of the cooperative research web in ecology, followed by the United Kingdom and Germany. At institutional level, University of California Davis and Max Planck Institute are two distinctive centers for cooperative research in ecology. The numbers of papers on ecological research in China is ranked the eleventh, but the quality of the papers is still low. The main countries in collaboration with China include the United States, the United Kingdom, Canada, Germany, Japan, Australia and France in ecological research. In the years from from 2008 to 2010, the hot spots of international ecology are mainly focused on biodiversity, climate change, gene variation, interactions among species and sexual selection, etc.

Keywords: Ecology, Competitive Situation, Bibliometric, Information Analysis, SCIE/SSCI Database

# Title: Ecology of Freshwater Fish

Full Journal Title: Ecology of Freshwater Fish

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Frank, B.M., Piccolo, J.J. and Baret, P.V. (2011), A review of ecological models for brown trout: Towards a new demogenetic model. *Ecology of Freshwater Fish*, **20** (2), 167-198.

Full Text: [2011\Eco Fre Fis20, 167.pdf](2011/Eco%20Fre%20Fis20,%20167.pdf)

Abstract: Ecological models for stream fish range in scale from individual fish to entire populations. They have been used to assess habitat quality and to predict the demographic and genetic responses to management or disturbance. In this paper, we conduct the first comprehensive review and synthesis of the vast body of modelling literature on the brown trout, Salmo trutta L., with the aim of developing the framework for a demogenetic model, i.e., a model integrating both population dynamics and genetics. We use a bibliometric literature review to identify two main categories of models: population ecology (including population dynamics and population genetics) and population distribution (including habitat-hydraulic and spatial distribution). We assess how these models have previously been applied to stream fish, particularly brown trout, and how recent models have begun to integrate them to address two key management and conservation questions: (i) How can we predict fish population responses to management intervention? and (II) How is the genetic structure of fish populations influenced by landscape characteristics? Because salmonid populations tend to show watershed scale variation in both demographic and genetic traits, we propose that models combining demographic, genetic and spatial data are promising tools for improving their management and conservation. We conclude with a framework for an individual-based, spatially explicit demogenetic model that we will apply to stream-dwelling brown trout populations in the near future.

Keywords: Approximate Bayesian Computation, Arborescent River Network, Bibliometric, Brown Trout, Charr Salvelinus-Fontinalis, Demogenetics, Dependent Individual Growth, Drift-Feeding Salmonids, Ecological Model, Effective Population-Size, Grayling Thymallus-Arcticus, Integral Projection Models, Literature, Literature Review, Population Dynamics, Population Genetics, Review, Salmo-Trutta l., Simulate Genetic Diversity

# Title: Ecology and Society

Full Journal Title: Ecology and Society

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Janssen, M.A. (2007), An update on the scholarly networks on resilience, vulnerability, and adaptation within the human dimensions of global environmental change. *Ecology and Society*, **12** (2), Article Number: 9.

Full Text: [2007\Eco Soc12, 9.pdf](2007/Eco%20Soc12,%209.pdf)

Abstract: In Janssen et al. (2006), we presented a bibliometric analysis of the resilience, vulnerability, and adaptation knowledge domains within the research activities on human dimensions of global environmental change. We have updated the analysis because 2 years have gone by since the original analysis, and 1113 more publications can now be added to the database. We analyzed how the resulting 3399 publications between 1967 and 2007 are related in terms of co-authorship and citations. The rapid increase in the number of publications in the three knowledge domains continued over the last 2 years, and we still see an overlap between the knowledge domains. We were also able to identify the “hot” publications of the last 2 years.

Keywords: Adaptation, Agriculture, Bibliometric Analysis, Citations, Climate-Change, Complexity, Ecosystems, Management, Research, Resilience, Social Vulnerability, Stability, Sustainability Science, Systems, Variability, Vulnerability

# Title: Econ Journal Watch

Full Journal Title: [Econ Journal Watch](http://ideas.repec.org/s/ejw/volone.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1708-3087

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Klein, D.B. and Chiang, E. (2004), The Social Science Citation Index: A black box - with an ideological bias? *Econ Journal Watch*, **1** (1), 134-165.

Full Text: [2004\Eco J Wat1, 134.pdf](2004/Eco%20J%20Wat1,%20134.pdf)

Abstract: In figuring eminence in the social sciences, the Social Science Citation Index (SSCI) is of great importance. Yet the SSCI selection process is a black box. Scrutiny of the SSCI journal list reveals that the stated SSCI journal selection criteria are vague and applied inconsistently. The Nation, The New Republic, and many other periodicals that fail to meet most conditions said to be a criterion for inclusion are nonetheless included in the SSCI. I investigate whether the process and resultant list are, not merely inconsistent, but ideologically biased. Although it is impossible to determine with great confidence whether there is an ideological bias, I present a variety of evidence of bias in favor of journals of a social democratic orientation and against journals of a classical liberal orientation.

Keywords: Bias, Black, Citation, Citation Count, Confidence, Criteria, Evidence, Ideological Orientation, Journal, Journals, Orientation, Periodicals, Process, Science Citation Index, Sciences, Selection, Selection Criteria, Social, Social Science Citation Index, Social Sciences, SSCI

? Klein, D.B. and Chiang, E. (2004), Citation counts and SSCI in personnel decisions: A survey of economics departments. *Econ Journal Watch*, **1** (1), 166-174.

Full Text: [2004\Eco J Wat1, 166.pdf](2004/Eco%20J%20Wat1,%20166.pdf)

Abstract: This paper reports the results of a survey of economics department chairs regarding the importance of citation counts in personnel decisions. The 30 responses vary, some reporting virtually no importance of citation counts, but 15 respondents report that citation counts usually or always come up in promotion cases. Fourteen respondents report that the weight given to citation counts increased over the past decade, while one reports that it declined. Fourteen expect it to increase further in the future, while only one expects it to decline. The survey also inquires about the importance of a journal’s inclusion in the Social Science Citation Index in deciding whether a publication is deemed “peer reviewed.” The results indicate that at many universities SSCI inclusion is important.

Keywords: Academic Economics, Citation, Citation Count, Citation Counts, Economics Profession, Hiring, Peer-Review, Personnel Decisions, Promotion, Publication, Science, Science Citation Index, Social Science Citation Index, SSCI, Universities

? Dawson, J.W. (2007), The empirical institutions-growth literature: Is something amiss at the top? *Econ Journal Watch*, **4** (2), 184-196.

Full Text: [2007\Eco J Wat4, 184.pdf](2007/Eco%20J%20Wat4,%20184.pdf)

Abstract: The past two decades have witnessed a resurgence of economic research on the most fundamental question: What causes economic growth? The research has suggested numerous determinants such as geography, physical capital, human capital, technology, population growth, and international trade. More recently, however, empirical growth research has focused on “institutions.” For example, the theme of the World Bank’s 2002 World Development Report was “Building Institutions for Markets.” Although growth theory’s focus on institutions is a more recent phenomenon, economists’ acknowledgment of institutions is nothing new. In 1776, Adam Smith proclaimed that the path to economic prosperity begins with a general presumption of freedom from government intervention, and, ever since, classical liberal economists have continued the tradition (e.g., Hayek 1954, Friedman and Friedman 1980). Finally, beginning with the work of Douglas North, the link between institutions and economic performance gradually worked its way into the more academic discussions of growth theory (e.g., North and Thomas 1973, North 1990). One obvious reason for the long-standing lack of attention on institutions in the empirical growth literature is the inherent difficulty in measuring institutions. Although measures of some aspects of institutions have existed for some time, such as the Freedom House indexes of political and civil freedom, measures of a more comprehensive view of institutions and especially economic institutions have been more elusive. This changed, however, with the publication of Economic Freedom of the World: 1975-1995 by James Gwartney, Robert Lawson, and Walter Block (1996). Their Economic Freedom of the World (EFW) Index was the most extensive measure available in terms of its coverage of countries, time, and attributes of freedom. Several other indexes of economic freedom are also noteworthy. Wright (1982) extended the Freedom House indexes of political and civil liberties to include a rating of economic freedom, but coverage is limited to a relatively short time period. Another attempt by Freedom House to publish a measure of economic freedom appears in Messick (1996), but publication of this measure has been discontinued. Scully and Slottje (1991) construct an index of economic liberty, but this measure also has a limited time dimension. The Heritage Foundation publishes a measure of economic freedom which is similar in many respects to the EFW index, but is available for a shorter period of time (see Holmes et al 1998). The EFW index has been more widely used than any of these alternatives, most likely because of its coverage of a longer time period. Because of its widespread use, the discussion that follows restricts attention to the EFW index. The EFW index is based on the classical conception of individual liberty, which emphasizes personal choice, private property, and freedom of exchange. An influential preliminary formulation of the index was Rabushka (1991). The EFW index currently encompasses five areas of freedom which are aggregated into a single summary index of economic freedom. The five major areas of the index are (1) size of government; (2) legal structure and security of property rights; (3) access to sound money; (4) freedom to trade internationally; and (5) regulation of credit, labor, and business. The underlying components (data) that comprise each area are listed in the Appendix. All underlying component data are converted to a scale from 1 (representing the least free) to 10 (most free). Each underlying component is equally weighted to construct an area index for each of the five areas. Then, equal weight is given to each of the five areas in constructing the EFW index (i.e., the five area indexes are averaged).(2) The index is available for a large number of countries in five-year intervals from 1975-1995, and annually since 1995.(3) As might be expected, the publication of the EFW index prompted an explosion of empirical research on the institutions-growth relationship. A recent survey by de Haan, Lundstrom, and Sturm (2006) cites at least 28 empirical studies that use the EFW index in some form to investigate the institutions growth relationship. They cite another 12 studies that use the EFW index to investigate the determinants of freedom itself. However, these numbers pale in comparison to the overall use of the EFW index in the literature.(4) A recent check of the Social Sciences Citation Index (SSCI) indicates 194 citations of the EFW index since its inception. Table 1 provides a complete list of the journals in which these citations have appeared. In addition, several journals not included in the SSCI, such as The Cato journal, Constitutional Political Economy and European Journal of Political Economy, have published many articles citing the index. A partial count of citations appearing in these journals is provided at the end of Table 1. This partial count, providing a total of 17 additional citations, is taken from references in the survey article by de Haan et al (2006). Despite the healthy number of citations to the ERW index, closer examination of the citation list reveals an interesting phenomenon with respect to the use of the index in the economics literature. Specifically, very few of the citing articles have appeared in top-tier journals. The next section of the paper discusses the large literature that has emerged since the EFW index was developed and the journals in which this literature has appeared. In a separate strand of literature, a number of empirical papers appearing almost exclusively in top-ranked journals have also addressed the relationship between institutions and economic performance. These articles have rarely cited either the EFW index itself or the large body of research which uses the index. This strand of the literature is discussed in the last section of the paper.

Keywords: Access, Acknowledgment, Alternatives, Business, Choice, Citation, Citations, Comparison, Conception, Coverage, Data, Economic, Economics, Empirical Studies, Examination, Explosion, Formulation, Freedom, General, Government Intervention, Growth, Human, Index, Institutions, International, Intervals, Intervention, Journal, Journals, Labor, Legal, Liberty, Literature, Measure, North, Papers, Performance, Physical, Population, Property, Property Rights, Publication, Regulation, Research, Rights, Scale, Security, Size, SSCI, Structure, Survey, Technology, Theory, Work

? Diamond, A.M. (2007), Thriving at Amazon: How Schumpeter lives in books today. *Econ Journal Watch*, **4** (3), 338-344.

Full Text: [2007\Eco J Wat4, 338.pdf](2007/Eco%20J%20Wat4,%20338.pdf)

Abstract: Amazon.com’s “Search Inside the Book” feature provides a new and exciting tool for bibliometric research. Over the last few years, a growing number of books listed on Amazon.com reference Schumpeter in some way. As of May 3, 2007, Amazon listed 8,086 books that in some way refer to Schumpeter. Of these, I currently have names and titles of 3,719 books in the Schumpeter Amazon database. Of these, I have done content-analysis for 1,176 books that make reference to Schumpeter. The main result is that a significant number of the references to Schumpeter are related to creative destruction. The percent of Schumpeter-references where the reference is related to creative destruction is significantly higher for books on business than books on economics. I believe this is a case where market demand reflects intellectual value, even if academic economics has not done much to incorporate Schumpeter’s central ideas.

Keywords: Amazon, Bibliometric, Bibliometric Research, Bibliometrics, Business, Content Analysis, Creative Destruction, Database, Demand, Economics, Feature, Growth, Market, Productivity, Research, Schumpeter, Technology, Value

# Title: Econometric Theory

Full Journal Title: [Econometric Theory](http://journals.cambridge.org/action/displayJournal?jid=ECT)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0266-4666

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Cribari-Neto, F., Jensen, M.J. and Novo, A.A. (1999), Research in econometric theory: Quantitative and qualitative productivity rankings. *Econometric Theory*, **15** (5), 719-752.

Full Text: [1999\Eco The15, 719.pdf](1999/Eco%20The15,%20719.pdf)

Abstract: We rank institutions and researchers based on a standardized page count of their econometric theory publications over the last 11 years (1986-1996) in 11 economics and statistics journals, Our ranking criteria differ from those employed by Hall (1987, Econometric Theory 3, 171-194; 1990, Econometric Theory 6, 1-16) and Baltagi (1998, Econometric Theory 14, 1-43). We weight the standardized page count of a publication by the publishing journal’s ‘impact factor,’ which measures a journal’s impact on the profession. We also depart from the previous rankings by focusing only on publications in theoretical econometrics, Our rankings reveal Yale University to be the leading academic institution, enjoying a large lead over the other top institutions: University of Chicago, M.I.T., and London School of Economics. Our rankings also reveal that Peter Phillips and Donald Andrews (both affiliated with Yale University) are the leading researchers in theoretical econometrics. We also provide rankings of countries and Ph.D. programs.

Keywords: Economics Departments, US, Publications, Statistics, Journals, Update

? Baltagi, B.H. (2007), Worldwide econometrics rankings: 1989-2005. *Econometric Theory*, **23** (5), 952-1012.

Full Text: [2007\Eco The23, 952.pdf](2007/Eco%20The23,%20952.pdf)

Abstract: This paper updates Baltagi’s (2003, Econometric Theory 19, 165-224) rankings of academic institutions by publication activity in econometrics over the period 1989-1999 to the period 1989-2005. This ranking is based on 16 leading international journals that publish econometrics articles. It is compared with the prior rankings by Hall (1987, Econometric Theory 3, 171-194; 1990, Econometric Theory 6, 1-16) for the period 1980-1988. In addition, a list of the top 150 individual producers of econometrics in these 16 journals over this 17-year period is provided. This is done for theoretical econometrics and also for all contributions in econometrics. Sensitivity analysis is provided using (i) alternative weighting factors given to the 16 journals taking into account impact citations, excluding self-citations, size and age of the journal, (II) alternative time intervals, namely, 2000-2005, 1995-2005, and 1989-2005, (iii) alternative ranking using the number of articles published in these journals, (iv) separate rankings for both institutions and individuals by journal, (v) rankings for institutions and individuals based on publications in three core econometrics journals. What is certain is that econometrics now occupies a position in teaching programs that puts it on an equal footing with microeconomic and macroeconomic theory; and in research there seems to be no area of economics untouched by econometric method. To keep abreast of these changes, we intend to provide regular updates of the rankings of research activity presented in this issue of Econometric Theory.

Keywords: Analysis, Citations, Economics Departmental Rankings, Individual Rankings, Journal Publications, Journals, Publication, Publications, Regular, Relative Impacts, Research, Research Productivity, Self-Citations, Update, US

# Title: Econometrica

Full Journal Title: Econometrica

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Oliver, E.R. (1969), Another generalization of the logistic growth function. *Econometrica*, **37**, 144-147.

Full Text: [1960-80\Econometrica37, 144.pdf](1960-80/Econometrica37,%20144.pdf)

# Title: Economic Geology

Full Journal Title: Economic Geology

ISO Abbreviated Title: Econ. Geol.

JCR Abbreviated Title: Econ Geol

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Moore, G.W. (1954), Extraction of uranium from aqueous solution by coal and some other materials. *Economic Geology*, **49**, 652-658.

Full Text: [-1959\Eco Geo49, 652.pdf](-1959/Eco%20Geo49,%20652.pdf)

Abstract: Uranium in nature is commonlya ssociatedw it hcarbonaceousm aterial. Laboratory studies were therefore conducted to determine the relative ability of varioust ypes of carbonaceoums aterial and someo ther substances to remove uranium from solution. The results of these experiments indicate that the low-rank coals are more effective in extracting uranium than any of the other materials used. A chemical determination shows that nearly 100 percent of the available uranium in solution is removed by subbituminous coal. The uranium is apparently retained in the coal by an irreversible process. The notable affinity of uranium for coalified plant remains suggests that some uranium deposits may have been formed over a long period of time by the extraction of uranium from dilute groundwater solutions. A possiblea pplicationo f the resultso f this work may be the extraction of uranium by coal from natural water or from waste solutions from uranium-processingin dustrial plants.

Fraser, D.C. (1961), Organic sequestration of copper. *Economic Geology*, **56**, 1063-1078.

Full Text: [1960-80\Eco Geo56, 1063.pdf](1960-80/Eco%20Geo56,%201063.pdf)

Abstract: A swampin southeasteNrne w Brunswickc ontainsu p to ten percent copper (dry weight) in forest peat. This mineralization is unusual in that the metali s not presentin megascopliucm pso f nativec opperb ut, rather, is invisible and appears to be in inorganic combination. Factors responsibfloe r the movemenotf the metali n the mobiles tatea re clearly diffusionc,a pillaritye, vaporatioann, dt he growtho f frostc rystals. The phenomenlia blef or thef ixationo f thec oppear rel essa pparent.V egetal concentratiosno, rptiona, ndc oprecipitatiohna ven o doubtp roducemd inor modificationosf the dispersiopna ttern. The dominanfta ctor effecting the immobilizatioonf the metal,h owevera, ppearsto be sequestratioonf the copperb y the organics edimentst,h erebyf orming a chelatec ompound. On the basiso f this study,t he onlyv aluet hat canb e assigned to thea ctivityo f microbeiss , possiblya, catalytice ffects, peedintgh ef ormation of the copperc ompounda lready stableu nder the chemicalc onditions imposed by the environment.

Ong, H.L. and Swanson, V.E. (1966), Adsorption of copper by peat, lignite and bituminous coal. *Economic Geology*, **61** (7), 1214-1231.

Full Text: [1960-80\Eco Geo61, 1214.pdf](1960-80/Eco%20Geo61,%201214.pdf)

Abstract: Laboratory experiments indicate that, from dilute solutions (0-50 ppm), peat rapidly (20 minutes) adsorbs about 98 percent of the copper, lignite about 66 percent, and coal about 7 percent. ‘Maximum copper contents attained by peat, lignite, and bituminous coal were 1, 0.6, and 0.005 percent, respectively.’ Adsorption is most efficient at plt values between 3 and 8. Organic matter from which humic acid is removed adsorbs more copper than organic matter containing humic acid. The amounts of metal adsorbed increases with surface area and ionic potential of the catron. As much as 2.2 percent copper in peat or lignite can be explained by adsorption from natural percolating waters.

# Title: Economic Inquiry

Full Journal Title: Economic Inquiry

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Kelly, M.A, and Bruestle, S. (2011), Trend of subjects published in economics journals 1969-2007. *Economic Inquiry*, **49** (3), 658-673.

Full Text: [2011\Eco Inq49, 658.pdf](2011/Eco%20Inq49,%20658.pdf)

Abstract: We describe the evolution of subject areas published in economics over four decades and calculate the percentage of articles published in each Journal of Economic Literature (JEL) subject category, with and without weighting by Eigenfactor.com’s Article Influence (AI). Finance, Development, and Industrial Organization have seen their share of total articles rise over the past four decades while Microeconomics, Macroeconomics, and Labor have seen their share fall. We use JEL codes to define specialty journals and find that more specialty journals tend to increase the overall percentage share for that subject. This effect is ambiguous when re-weighted by AI.

# Title: The Economic Journal

Full Journal Title: [The Economic Journal](http://uk.jstor.org/journals/00130133.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Johnes, G. (1998), Measures of research output: University departments of economics in the UK, 1984-8. *The Economic Journal*, **100** (401), 556-560.

Full Text: [E\Eco J100, 556.pdf](E/Eco%20J100,%20556.pdf)

# Title: Economic and Political Weekly

Full Journal Title: Economic and Political Weekly

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Raina, D. (1998), Historiographic concerns underlying Indian Journal of the History of Science: A bibliometric inference. *Economic and Political Weekly*, **33** (8), 407-+.

Abstract: This review proposes that the papers appearing in the Indian Journal of the History of Science fall into a genre of the history of science writing that strictly observes the internal- external divide. The attempt here is to identify the historiographic elements that constitute this genre of the history of science in India. Based on a bibliometric analysis, the priorities of historians of science in India publishing in the journal are identified. These priorities and the underlying historiography render certain kinds of problems amenable for research and investigation and foreclose the pursuit of others. In attempting a sociology of the discipline, a very preliminary one is proposed here, other themes and areas may be identified. In addition, it is suggested that the conservatism of historians of science, tied as they are to the apron-strings of the scientific establishment, has curtailed the growth of the discipline. While this review is partisan, it also seeks to gauge the growth of the discipline in terms of the precepts set down by the founders of the IJHS itself

Keywords: Bibliometric, Bibliometric Analysis, India, Journal, Publishing, Research

# Title: Economic Systems Research

Full Journal Title: [Economic Systems Research](http://proquest.umi.com/pqdweb?RQT=318&pmid=34458), [Economic Systems Research](http://weblinks2.epnet.com/authHjafDetail.asp?tb=1&_ua=bo+B%5F+db+buhjnh+bt+TD++%22EYS%22+321A&_ug=sid+5196F73D%2D19B6%2D4916%2DAA7C%2D8D415551010A%40sessionmgr2+dbs+buh+9B8C&_us=sm+ES+E6C7&_uso=st%5B0+%2DTD++%22EYS%22+tg%5B0+%2D+db%5B0+%2Dbuh+op%5B0+%2D+h), [Economic Systems Research](http://taylorandfrancis.metapress.com/(ei5gkgil3025zl2cqdoe1555)/app/home/journal.asp?referrer=parent&backto=linkingpublicationresults,1:104572,1)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Meyer, M. (2002), Tracing knowledge flows in innovation systems: An informetric perspective on future research science-based innovation. *Economic Systems Research*, **14** (4), 323-344.

Full Text: [E\Eco Sys Res14, 323.pdf](E/Eco%20Sys%20Res14,%20323.pdf)

Abstract: This paper gives an overview of informetric approaches to studying the science-technology linkage. Informetrics can be understood as the application of mathematical and statistical methods to the information process in science and technology-oriented activities. A number of theoretical contributions over the past few years in the area of innovation studies emphasize the exchange of actors in innovation systems and a shift in the division of labour between publicly funded research and industrial development of technology. Based on a review of informetric literature in the area, the paper derives a typology of three informetric approaches to study the science/technology linkage - namely analyses of patent citations, industrial publications, and university patenting. For each approach, merits and possible disadvantages are discussed. The results from studies of the Finnish innovation system are used to illustrate advantages and disadvantages of the three approaches.

Keywords: Science, Technology, Patents, Publications

? Valentin, F. and Jensen, R.L. (2002), Reaping the fruits of science: Comparing exploitations of a scientific breakthrough in European innovation systems. *Economic Systems Research*, **14** (4), 363-388.

Full Text: [2002\Eco Sys Res14, 363.pdf](2002/Eco%20Sys%20Res14,%20363.pdf)

Abstract: This paper is an attempt to unpack the emergence and dynamics of science-based technologies in conceptual forms that allow us to understand better when and how the social and economic organization of search and problem-solving matters. The evolution over two decades of a specific science-based technology is mapped with data from its 192 patents. For the five European countries generating the majority of patents, we identify the host organizations of all 275 inventors involved in the R&D behind the patents. Using network analysis we then map the evolution of separate innovation systems and their structural and evolutionary characteristics. The best performing system combines a cumulative pattern with frequent and shifting connections to non-system R&D partners while maintaining a small core of almost omnipresent inventor-organizations. The role of multinational corporations in orchestrating innovation systems is apparent.

Keywords: Innovation Systems, Science-TECHNOLOGY Dynamics, Search Costs, Biotechnology

# Title: Economica

Full Journal Title: [Economica](http://www.jstor.org/action/showPublication?journalCode=economica)

ISO Abbreviated Title: Economica

JCR Abbreviated Title: Economica

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hall, H. (1923), Statistical bibliography in relation to the growth of modern civilization. *Economica*, **9**, 266-267.

Full Text: [-1959\Economica9, 266.pdf](-1959/Economica9,%20266.pdf)

# Title: Economics of Innovation and New Technology

Full Journal Title: Economics of Innovation and New Technology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Caldas, A. (2003), Are newsgroups extending “invisible colleges” into the digital infrastructure of science? *Economics of Innovation and New Technology*, **12** (1), 43-60.

Full Text: [E\Eco Inn New Tec12, 43.pdf](E/Eco%20Inn%20New%20Tec12,%2043.pdf)

Abstract: This paper contributes to the debate on the influence of electronic communication on the informal exchange of information among scientists and practitioners. The research is focused on an empirical analysis of three specialised Newsgroups in “speech technology” (comp.speech, comp.speech.research and comp.speech.users), over the period 1992-2000. Looking at these discussion forums as electronic systems of social interaction, it is appropriate to ask whether they are extending the traditional social networks of “invisible colleges” into the digital age? This paper concludes that this is indeed occurring.

First, to a significant extent these electronic environments support international and inter-sectoral remote collaboration. Secondly, these forums support the creation of key properties of “invisible colleges”, persistent interaction among peers and a “division of labour” in the accumulation of expertise. Both of these properties are supported by a longitudinal network analysis of the forums.

Further opportunities for inquiry are discussed in the concluding section.

Keywords: Scientific Communities, Invisible Colleges, Scientific Communication, Newsgroups, Electronic Communication, Webmetrics

? Garskova, I.M. and Leonard, C.S. (2003), A virtual community in transition, a russian social science and humanities network. *Economics of Innovation and New Technology*, **12** (1), 61-76.

Full Text: [E\Eco Inn New Tec12, 61.pdf](E/Eco%20Inn%20New%20Tec12,%2061.pdf)

Abstract: This article is about evolving patterns of participation in an electronically-supported network organised in 1999 in Russia for research scholars in the social sciences and humanities (the Russian Social Science and Humanities Network, RSSH.Net). The service provides search, databases, discussion and information services for a world-wide academic community interested in Russian studies. Its users are located in Russia, the FSU, Central and Eastern European countries and in the US, EU, Japan and China. The analysis draws on data from the log of the Web service, describing senders and their messages by monthly data for 28 months, 1999-2002. The results show stable participation, predominantly by Russian users, among whom messaging activity is highly concentrated as well as localised in the Moscow region’s subscribers. The usage of the RSSH.Net for messaging is somewhat lower, but still roughly within the same range as that found in comparable networks based in the US.

Keywords: Networks, Newsgroups, Science Communities, ICT, Transition, Russia

# Title: Economics Letters

Full Journal Title: [Economics Letters](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5860&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=d6d1612ed4b777f095eba5d2d9011c25)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Urzúa, C.M. (2000), A simple and efficient test for Zipf’s law. *Economics Letters*, **66** (3), 257-260.

Full Text: [E\Eco Let66, 257.pdf](E/Eco%20Let66,%20257.pdf)

Abstract: This paper presents a simple and locally optimal test for Zipf’s law. Its use is illustrated in the case of the largest US metropolitan areas. An objection to the general relevance of that law is also presented.

Keywords: Zipf’s Law, Rank-Size Law

Naldi, M. (2003), Concentration indices and Zipf’s law. *Economics Letters*, **78** (3), 329-334.

Full Text: [E\Eco Let78, 329.pdf](E/Eco%20Let78,%20329.pdf)

Abstract: The relationships between Zipf’s law (a relevant model for the firms’ size and the financial investment amounts) and the major concentration indices are derived. The Hirschman–Herfindahl index is the most sensitive index in contexts where Zipf’s law applies.

Keywords: Zipf’s Law, Concentration Indices, Hirschman–Herfindahl Index, Gini Index

# Title: Econtent

Full Journal Title: Econtent

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Manafy, M. (2007), Scopus harnesses the h-index - to increase the quality and reliability of citation tracking. *Econtent*, **30** (3), 10-11

Keywords: Citation, H Index, H-Index, Quality, Reliability, Scopus

# Title: Ecoscience

Full Journal Title: Ecoscience

ISO Abbreviated Title: Ecoscience

JCR Abbreviated Title: Ecoscience

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Olden, J.D. (2007), How do ecological journals stack-up? Ranking of scientific quality according to the h index. *Ecoscience*, **14** (3), 370-376.

Abstract: The competitive nature of today’s scientific environment requires the availability of ranking indicators that are both fair and easy to compute. An ecologist’s publication record is the paper-trail that defines his/her scientific output, and assessment of that record hinges heavily on the popularity and prestige of the journal(s) where the research is published. Although highly criticized, the ISI (R) Impact Factor is still recognized as the primary measure of journal “quality”. In this study, I apply a recent bibliometric measure, Hirsch’s h index, to rank the scientific quality of I I I journals in the ecological sciences and to track changes in journal performance over the past 25 y. Among the top-ranked ecological journals, I found that Trends in Ecology and Evolution has the highest h index, followed closely by journals including Ecologv, Molecular Ecology, Evolution, and American Naturalist. A moderate positive relationship between a journal’s ISI (R) Impact Factor versus h index (54% explained variation) suggests that the It index provides an alternative perspective on the citation performance of journals by measuring significance and sustainability in scientific production over longer time periods. Trends in h values over the past 25 y suggest that sharp increases in the performance of specialized journals have been in response to popularity and shifting research priorities in ecology (e.g., Molecular Ecology, Global Change Biology), whereas sustained growth for other journals reflects prestige and the continued popularity that comes with publication excellence. A Hirsch-based ranking of ecological journals, either alone or in combination with the Impact Factor, provides a robust indicator for assessing scientific achievement and tracking the performance of journals over time.

Keywords: Achievement, Alternative, Assessment, Availability, Bibliometric, Changes, Citation, Citations, Environment, Game, Growth, h Index, h-Index, Impact Factor, Indicator, Indicators, ISI, Journal, Journals, Numbers, Primary, Publication, Publication Record, Quality, Ranking, Record, Research, Researchers, Sciences, Scientific Output, Scientific Production, Sustainability

# Title: Ecotoxicology

Full Journal Title: [Ecotoxicology](http://www.springerlink.com/(ksnmre45r2hn2kyjgowpec3v)/app/home/journal.asp?referrer=backto&backto=linkingpublicationresults,1:100168,1;&absoluteposition=32#A32)

ISO Abbreviated Title: Ecotoxicology

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ISSN: 0963-9292

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Journal Country/Territory: Netherlands

Language: English

Publisher: Kluwer Academic Publ

Publisher Address: Spuiboulevard 50, PO Box 17, 3300 AA Dordrecht, Netherlands

Subject Categories:

Ecology: Impact Factor 1.108, / (2000)

Environmental Sciences: Impact Factor 1.108, 42/127 (2000)

Toxicology: Impact Factor 1.108, / (2000)

? van Dijk, H.F.G., Brussaard, L., Stein, A., Baerselman, F., De Heer, H., Brock, T.C.M., van Donk, E., Vet, L.E.M., van der Gaag, M.A., van Gestel, C.A.M., van der Hoeven, N., De Jong, F.M.W., van der Linden, A.M.A., van Noort, P.C.M., Oomen, P.A. and van Vliet, P.J.M. (2000), Field research for the authorisation of pesticides. *Ecotoxicology*, **9** (6), 377-381.

Full Text: [2000\Ecotoxicology9, 377.pdf](2000/Ecotoxicology9,%20377.pdf)

Abstract: On request of the Dutch government a committee of the Health Council of the Netherlands has reviewed the role that results of field research in its broadest sense (i.e., including multi-species toxicity tests in the laboratory, research on model ecosystems et cetera) can play in ecotoxicological risk assessment for the authorisation of pesticides. The Committee believes that field research can provide valuable additional data about the exposure of non-target organisms and the resultant effects at population, community and ecosystem level. However, it frequently is unclear how these data might be used in reaching a decision about authorisation. To solve this problem, it is necessary to specify what is understood by “unacceptable damage”. Both more clearly formulated protection goals of the government and a better understanding of the ecological significance of effects are needed to clarify this. Furthermore, the Committee points out that the statistical power of field trials must be sufficient to allow for the detection of changes that might be regarded as ecologically relevant. Finally, it recommends keeping a finger on the pulse in relation to authorised pesticides by monitoring their presence in environmental compartments and by investigating their role in suddenly occurring mortality among conspicuous animal species, such as birds, fish and honeybees. This kind of research forms a safety net for substances that have been wrongly authorised.

Keywords: Authorisation, Field Research, Model Ecosystems, Monitoring, Pesticides

? Odjegba, V.J. and Fasid, I.O. (2004), Accumulation of trace elements by *Pistia stratiotes*: Implications for phytoremediation. *Ecotoxicology*, **13** (7), 637-646.

Full Text: [2004\Ecotoxicology13, 637.pdf](2004/Ecotoxicology13,%20637.pdf)

Abstract: The toxicity of eight potentially toxic trace elements (Ag, Cd, Cr, Cu, Hg, Ni, Pb and Zn) to *Pistia stratiotes* was examined to determine if this plant showed sufficient tolerance and metal accumulation to be used to phytoremediate waste water and/or natural water bodies polluted with these heavy metals. Young plants of equal size were grown hydroponically and amended with 0, 0.1, 0.3, 0.5, 1.0, 3.0 and 5.0 mM of each heavy metal individually for 21 days. Root elongation as well as emergence of new roots decreased significantly with increase in metal concentrations. The plant had the lowest and the highest tolerance indices for Hg and Zn respectively. The study indicated reduction in the rate of leaf expansion relative to metal type, their concentrations and the duration of exposure. A significant reduction in biomass production was observed in metal treated plants compared with the control plants. The relative growth rate of P. stratiotes was retarded by heavy metals under study. All trace elements accumulated to higher concentrations in root tissue rather than in shoot. Trace element accumulation in tissues and the bioconcentration factors were proportional to the initial concentration of individual metals in the growth medium and the duration of exposure. In terms of trace element removal, P. stratiotes presented differential accumulation and tolerance levels for different metals at similar treatment conditions. The implications of these results for phytoremediation are discussed.

Keywords: Accumulation, Biomass, Copper, Growth, Metals, Nickel, Phytoaccumulation, Phytoremediation, *Pistia Stratiotes*, Pollution, Ryegrass, Tolerance, Toxicity, Trace Elements, Typha-Latifolia, Wetland Plants

# Title: Ecotoxicology and Environmental Safety

Full Journal Title: [Ecotoxicology and Environmental Safety](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6770&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=1493b5c089a12699be4823b460d962b3)

ISO Abbreviated Title: Ecotox. Environ. Safe.

JCR Abbreviated Title: Ecotox Environ Safe

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Journal Country/Territory: England

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Publisher: Academic Press Inc

Publisher Address: 525 B St, Ste 1900, San Diego, CA 92101-4495

Subject Categories:

Environmental Sciences: Impact Factor 1.276, 35/126 (1999), Impact Factor 1.060, 50/127 (2000)

Toxicology: Impact Factor

Hutton, M. (1983), Sources of cadmium in the environment. *Ecotoxicology and Environmental Safety*, **7** (1), 9-24.

Full Text: [E\Eco Env Saf7, 9.pdf](E/Eco%20Env%20Saf7,%209.pdf)

Abstract: This paper is concerned with quantifying the major sources of cadmium in the European Community and assessing the relative significance of such inputs to the environmental compartments, air, land, and water. The methodology involved identification of potential sources of cadmium, including natural processes, as well as those associated with human activities. This was followed by a review of any emission studies of these processes and subsequent estimation of an emission factor for each source. The emission factor was applied to the most recent production or consumption data for the process in question to obtain an estimate of the annual discharge. The steel industry and waste incineration, followed by volcanic action and zinc production, are estimated to account for the largest emissions of atmospheric cadmium in the region. Waste disposal results in the single largest input of cadmium to land, the quantity of cadmium associated with this source is greater than the total from the four other major sources--coal combustion, iron and steel production, phosphate fertilizer manufacture and use, and zinc production. The characterization of cadmium inputs to aquatic systems is incomplete but of the sources considered, the manufacture of cadmium-containing articles accounts for the largest discharge, followed by phosphate fertilizer manufacture and zinc production.

Singh, R.P., Varshney, K.G. and Rani, S. (1985), Adsorption thermodynamics of carbofuran on sandy clay loam and silt loam soils. *Ecotoxicology and Environmental Safety*, **10** (3), 309-313.

Full Text: [E\Eco Env Saf10, 309.pdf](E/Eco%20Env%20Saf10,%20309.pdf)

Abstract: The adsorption of carbofuran on sandy clay loam and silt loam soils has been studied at 30 and 50°C. Adsorption data for both soils are in close agreement with the Freundlich isotherms and yield “S” class isotherms. The order of adsorption of carbofuran is in accordance with the partial molal free energy changes and conforms to the mobility of carbofuran in different soils. The thermodynamic constant (*K*0) and standard free energy (Δ*G*o), enthalpy (Δ*H*o), and entropy changes (Δ*S*o) have also been calculated for predicting the nature of adsorption.

Varshney, K.G., Rani, S. and Singh, R.P. (1986), Adsorption thermodynamics of carbofuran on antimony(V) silicate cation exchanger. *Ecotoxicology and Environmental Safety*, **11** (2), 179-183.

Full Text: [E\Eco Env Saf11, 179.pdf](E/Eco%20Env%20Saf11,%20179.pdf)

Abstract: The adsorption thermodynamics of carbofuran has been studied on antimony (V) silicate cation exchanger at 30 and 50°C. The adsorption isotherms of carbofuran have been found to follow the Freundlich adsorption model and yield “S” class isotherms. The order of adsorption of carbofuran is in accordance with the partial molal free-energy changes in the exchanger. The thermodynamic equilibrium constant (*K*0), standard free energy (Δ*Go*), enthalpy (Δ*Ho*), and entropy (Δ*So*) changes have also been calculated for predicting the nature of adsorption.

Singh, R.P., Kumari, K. and Saxena, S.K. (1987), Adsorption thermodynamics of carbofuran on acid and base saturated soils. *Ecotoxicology and Environmental Safety*, **13** (2), 253-260.

Full Text: [E\Eco Env Saf13, 253.pdf](E/Eco%20Env%20Saf13,%20253.pdf)

Abstract: The adsorption of carbofuran on hydrogen, sodium, and calcium saturated soils has been studied at 25 and 50°C. The adsorption data for all types of soils is in close agreement with Freundlich isotherms and yielded S-class isotherms. The maximum adsorption was observed in acid saturated soil. Therefore, it has been in accordance with the partial molal free energy changes (Image) and *Kd* values. The adsorption has been lower at higher temperatures. The thermodynamic constant (*K*0), standard free energies (Δ*G*o), enthalpies (Δ*H*o), and entropy changes (Δ*S*o) have been calculated for predicting the nature of adsorption.

van Gestel, C.A. and Ma, W.C. (1988), Toxicity and bioaccumulation of chlorophenols in earthworms, in relation to bioavailability in soil. *Ecotoxicology and Environmental Safety*, **15** (3), 289-297.

Full Text: [E\Eco Env Saf15, 289.pdf](E/Eco%20Env%20Saf15,%20289.pdf)

Abstract: The acute toxicity of five chlorophenols for two earthworm species was determined in two sandy soils differing in organic matter content and the results were compared with adsorption data. Adsorption increased with increasing organic matter content of the soils, but for tetra-and pentachlorophenol was also influenced by soil pH. Earthworm toxicity was significantly higher in the soil with a low level of organic matter. This difference disappeared when LC50 values were recalculated to concentrations in soil solution using adsorption data. Eisenia fetida andrei showed LC50 values lower than those of Lumbricus rubellus although bioaccumulation was generally higher in the latter species. Toxicity and bioaccumulation based on soil solution concentrations increased with increasing lipophilicity of the chlorophenols. The present results indicate that the toxicity and bioaccumulation and therefore the bioavailability of chlorophenols in soil to earthworms are dependent on the concentration in soil solution and can be predicted on the basis of adsorption data. Both the toxicity of and bioaccumulation data on chlorophenols in earthworms demonstrated surprisingly good agreement with those on chlorophenols in fish.

Guastadisegni, C., Mantovani, A., Ricciardi, C., Stazi, A.V., Maffi, D. and Salvati, A.M. (1989), Hematotoxic effects in the rat of a toluene dinitro derivative after short-term exposure. *Ecotoxicology and Environmental Safety*, **17** (1), 21-29.

Full Text: [E\Eco Env Saf17, 21.pdf](E/Eco%20Env%20Saf17,%2021.pdf)

Abstract: 3,5-Dinitro-4-chloro-alpha, alpha, alpha-trifluorotoluene (DNCTT) is an intermediate in the synthesis of dinitroaniline herbicides and was involved in an episode of ground water pollution in 1977. The compound presents a high environmental persistence, which may have possible implications concerning public health. In one experiment male Sprague-Dawley rats were administered DNCTT for 3 days at a dose level of 150 mg/kg body wt by oral gavage. Groups of rats were sacrificed up to 10 days after the end of the administration, at 2-day intervals. Methemoglobin was increased up to Day 7, white blood cells were also increased both in peripheral blood and in bone marrow smears. Spleen relative weights were observed to increase slightly at Days 7 and 10, microscopic examination revealed marked congestion with an increased density of the spleen’s white pulp. In a similar scheduled experiment, but at a dose level of 300 mg/kg body wt, the bone marrow white cell series were not affected initially, but were affected after 3 days at the end of the administration. DNCTT has a definite effect on white cells.

Struijs, J. and Stoltenkamp, J. (1990), Headspace determination of evolved carbon dioxide in a biodegradability screening test. *Ecotoxicology and Environmental Safety*, **19** (2), 204-211.

Full Text: [E\Eco Env Saf19, 204.pdf](E/Eco%20Env%20Saf19,%20204.pdf)

Abstract: A headspace method to measure the carbon dioxide evolved in a screening biodegradability test is described. Use was made of conventional serum bottles, sealed with butyl rubber septa, through which headspace samples were taken after acidification and equilibration of the test solution. For each determination a serum bottle was sacrificed. The gas samples were injected directly into the reaction chamber of a carbon analyzer. Eighteen chemicals varying in solubility and biological properties were submitted to the test. Where possible, mineralization of test compounds was monitored through dissolved organic carbon analysis in addition to CO2 analyses. The reliability of the method was verified by comparing the measured concentration of dissolved inorganic carbon of a standard sodium carbonate solution with values calculated from measured concentrations of carbon dioxide in the headspace after acidification. Results of biodegradability testing are discussed in view of the suitability of the method to poorly soluble compounds.

Okkerman, P.C., vd Plassche, E.J., Slooff, W., van Leeuwen, C.J. and Canton, J.H. (1991), Ecotoxicological effects assessment: A comparison of several extrapolation procedures. *Ecotoxicology and Environmental Safety*, **21** (2), 182-193.

Full Text: [E\Eco Env Saf21, 182.pdf](E/Eco%20Env%20Saf21,%20182.pdf)

Abstract: In the future, extrapolation procedures will become more and more important for the effect assessment of compounds in aquatic systems. For achieving a reliable method these extrapolation procedures have to be evaluated thoroughly. As a first step three extrapolation procedures are compared by means of two sets of data, consisting of (semi)chronic and acute toxicity test results for 11 aquatic species and 8 compounds. Because of its statistical basis the extrapolation procedure of van Straalen and Denneman is preferred over the procedures of the EPA and Stephan et al. The results of the calculations showed that lower numbers of toxicity data increase the chance of underestimating the risk of a compound. Therefore it is proposed to extend the OECD guidelines for algae, Daphnia, and fish with chronic (aquatic) toxicity tests for more species of different taxonomic groups.

Chou, C.C. and Que Hee, S.S. (1992), Microtox EC50 values for drinking water by-products produced by ozonolysis. *Ecotoxicology and Environmental Safety*, **23** (3), 355-363.

Full Text: [E\Eco Env Saf23, 355.pdf](E/Eco%20Env%20Saf23,%20355.pdf)

Abstract: The aim was to determine the Microtox EC50 values of some aliphatic aldehydes and carboxylic acids of normal chain length with 1-14 carbon atoms since these compounds have been detected as ozonolysis by-products in drinking water. The aqueous EC50 values decreased with increasing chain length except for formaldehyde and for the C1-C7 acids. At chain lengths above C7, where methanolic saline solutions were utilized to promote solubility, the aldehydes were more toxic than their corresponding carboxylic acids. Below a chain length of C7, the reverse situation applied. More precise and sensitive EC50 values were observed at 15 and 25 min than at 5 min. Both C14 aldehyde and acid as well as palmitoleic acid showed luminescence in methanolic saline solutions. The C14 compounds are known natural substrates for bacterial luciferase, and the present findings confirm this for Photobacterium phosphoreum. The concentrations of the aldehyde and/or carboxylic acid ozonolysis by-products reported in drinking water could not be detected by the Microtox test. This is the first report of Microtox EC50 values for these carboxylic acids and for aldehydes of chain lengths greater than C4.

Notenboom, J., Cruys, K., Hoekstra, J. and van Beelen, P. (1992), Effect of ambient oxygen concentration upon the acute toxicity of chlorophenols and heavy metals to the groundwater copepod Parastenocaris germanica (Crustacea). *Ecotoxicology and Environmental Safety*, **24** (2), 131-143.

Full Text: [E\Eco Env Saf24, 131.pdf](E/Eco%20Env%20Saf24,%20131.pdf)

Abstract: Acute static toxicity experiments have been performed under normoxic and hypoxic conditions. The test animals used were adults of the groundwater-adapted copepod Parastenocaris germanica. The animals originated from a sandy, gravelly phreatic aquifer of the Meuse valley in The Netherlands. Toxicants applied were pentachlorophenol, 3,4-dichlorophenol, zinc, and cadmium. The results were statistically evaluated by a log-logistic model. LC50 and LC5 values with 95% confidence limits were calculated. Response models of application under both oxygen conditions were compared. The influence of ambient oxygen concentration on sensitivity appeared to be very small, only in the case of pentachlorophenol were hypoxic and normoxic models slightly but significantly different. Comparisons with the sensitivity of other organisms are made and the results are discussed against the specific physiological adaptations of the organisms to groundwater conditions.

Okkerman, P.C., van de Plassche, E.J., Emans, H.J. and Canton, J.H. (1993), Validation of some extrapolation methods with toxicity data derived from multiple species experiments. *Ecotoxicology and Environmental Safety*, **25** (3), 341-359.

Full Text: [E\Eco Env Saf25, 341.pdf](E/Eco%20Env%20Saf25,%20341.pdf)

Abstract: For effects assessment several extrapolation methods are used which can be applied to estimate the concentration of toxic chemicals above which ecosystems may be affected. At present, however, it is uncertain whether the values calculated with these methods really represent concentrations harmless to ecosystems. Therefore, a validation is carried out by comparing no-observed-effect concentrations derived from multiple species experiments with extrapolated values. In this study validation was restricted to the methods of Aldenberg and Slob (1993) and Wagner and L‡kke (Water Res. 25, 1237-1242, 1991), and a modification of the method of the Environmental Protection Agency (Slooff, 1992). Also, only organic compounds were studied. With restrictions, due to the paucity of data, it is concluded that single species toxicity data are a good starting point for establishing “safe” values for the aquatic ecosystem. Furthermore, extrapolation methods seem to be a good basis for determining these values if sufficient toxicity data are available for sensitive taxonomic groups. From the results of this study it was not possible to give preference to one of the validated extrapolation methods, but on theoretical ground the methods of Aldenberg and Slob and Wagner and Lokke are perferred.

Ottaviani, M., Crebelli, R., Fuselli, S., Larocca, C. and Baldassarri, L.T. (1993), Chemical and mutagenic evaluation of sludge from a large wastewater treatment plant. *Ecotoxicology and Environmental Safety*, **26** (1), 18-32.

Full Text: [E\Eco Env Saf26, 18.pdf](E/Eco%20Env%20Saf26,%2018.pdf)

Abstract: Digested sludges from a wastewater treatment plant were analyzed to assess their level of contamination by some organic (polychlorobiphenyls (PCBs) and chlorinated pesticides) and inorganic (heavy metals) micropollutants and their mutagenicity features. The heavy metal content in none of the samples exceeded the limits set out in EEC Directive 276/86, as far as PCBs are concerned, the sludges analyzed indicated a level of contamination up to two orders of magnitude higher than some Italian agricultural soils. Mutagenicity assays on either crude or fractionated sludge extracts using *Salmonella typhimurium* tester strains TA98 and TA 100 gave negative results, thus suggesting the absence of genotoxic contaminants in the samples investigated.

Keywords: Chromatography Mass-Spectrometry, Anaerobic Fluctuation Tests, Sewage-Sludge, Human Feces, Fecal Extracts, Heavy-Metals, Soils, Water

Geyer, H.J., Scheunert, I., Rapp, K., Gebefügi, I., Steinberg, C. and Kettrup, A. (1993), The relevance of fat-content in toxicity of lipophilic chemicals to terrestrial animals with special reference to dieldrin and 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD). *Ecotoxicology and Environmental Safety*, **26** (1), 45-60.

Full Text: [E\Eco Env Saf26, 45.pdf](E/Eco%20Env%20Saf26,%2045.pdf)

Abstract: Lipophilic chemicals such as chlorinated hydrocarbon insecticides and other *persistent* chemicals such as 2,3,7,8-tetrachlorodibenzo-*p*-dioxin (TCDD) are fat soluble chemicals and are readily bioconcentrated in animal fat depots. The modifying role of the body fat content in the toxicity of chlorinated cyclodiene insecticides to insects and in the toxicity of TCDD to different mammals was investigated. The single oral acute 30-day LD50 data of TCDD in different mammals are presented and correlated with their total body fat content. A two linear regression equation with log/log values was obtained. It is concluded that the storage of TCDD and other related lipophilic and persistent chemicals in lipids of organisms is, in a sense, a detoxication mechanism by which the compounds are removed from sites of action and/or receptors. Therefore, terrestrial organisms such as insects and mammals with higher total body fat content can accumulate and tolerate higher chlorinated hydrocarbon insecticide and TCDD doses than organisms with lower fat content. The different sensitivity of mammals of various species, strains, body weight, sex, age, etc. to acute toxicity of TCDD and related lipophilic persistent chemicals can mainly be explained by differences in total body fat content.

Keywords: Dibenzo-*p*-Dioxins, Guinea-Pigs, Tissue Distribution, Rhesus-Monkeys, Body-Fat, Mice, Excretion, Rats, “2,3,7,8-Tetrachlorodibenzo-*p*-Dioxin, C57Bl/6J

Romijn, C.A., Luttik, R., van de Meent, D., Slooff, W. and Canton, J.H. (1993), Presentation of a general algorithm to include effect assessment on secondary poisoning in the derivation of environmental quality criteria. Part 1. Aquatic food chains. *Ecotoxicology and Environmental Safety*, **26** (1), 61-85.

Full Text: [E\Eco Env Saf26, 61.pdf](E/Eco%20Env%20Saf26,%2061.pdf)

Abstract: Effect assessment on secondary poisoning can be an asset to effect assessments on direct poisoning in setting quality criteria for the environment. This study presents an algorithm for effect assessment on secondary poisoning. The water-fish-fish-eating bird or mammal pathway was analyzed as an example of a secondary poisoning pathway. Parameters used in this algorithm are the bioconcentration factor for fish (BCF) and the no-observed-effect concentration for the group of fish-eating birds and mammals (NOECfish-eater). For the derivation of reliable BCFs preference is given to the use of experimentally derived BCFs over QSAR estimates. NOECs for fish eaters are derived by extrapolating toxicity data on single species. Because data on fish-eating species are seldom available, toxicity data on all birds and mammalian species were used. The proposed algorithm (MAR = NOECfish-eater/BCF) was used to calculate MARS (maximum acceptable risk levels) for the compounds lindane, dieldrin, cadmium, mercury, PCB153, and PCB118. By subsequently, comparing these MARs to MARs derived by effect assessment for aquatic organisms, it was concluded that for methyl mercury and PCB153 secondary poisoning of fish-eating birds and mammals could be a critical pathway. For these compounds, effects on populations of fish-eating birds and mammals can occur at levels in surface water below the MAR calculated for aquatic ecosystems. Secondary poisoning of fish-eating birds and mammals is not likely to occur for cadmium at levels in water below the MAR calculated for aquatic ecosystems.

Romijn, C.A.F.M., Luttik, R. and Canton, J.H. (1994), Presentation of a general algorithm to include effect assessment on secondary poisoning in the derivation of environmental quality criteria. 2. Terrestrial food chains. *Ecotoxicology and Environmental Safety*, **27** (2), 107-127.

Full Text: [E\Eco Env Saf27, 107.pdf](E/Eco%20Env%20Saf27,%20107.pdf)

Abstract: In a previous study a simple algorithm was presented for effect assessment on secondary poisoning of birds and mammals. This algorithm (MPC = NOECfish-eater/BCFfish) was drawn up by analyzing a two-step aquatic food chain (water-fish-bird/mammal). The algorithm was used to test whether quality criteria set for surface water, based on effect assessment for aquatic organisms, constitute a “safe” level for secondary poisoning. The present study analyzes whether this algorithm can equally well be used for effect assessment in a terrestrial food chain. The pathway soil-earthworm-bird/mammal was used as an example for a terrestrial food chain. Literature data of six selected compounds (lindane, dieldrin, DDT, PCP, cadmium, and mercury) on both bioconcentration factors for earthworms and toxicity data for birds and mammals were studied. Important differences were found between BCFs for this terrestrial pathway and BCFs for the aquatic pathway analyzed in the previous study. It was found that BCFs for earthworms were more dependent on soil-related properties than on compound-specific properties. Hence, it was concluded that the algorithm, MPC = NOECworm-eater/BCFworm can be used only for effect assessment on terrestrial food chain in defined situations. By calculating maximum permissible concentrations for secondary poisoning (MPCsp) for a standard soil situation and comparing these to, MPCs for soil organisms, it was concluded that secondary poisoning could be a critical pathway for cadmium and methyl mercury. For methyl mercury secondary poisoning in an aquatic food chain was also a critical pathway. Secondary poisoning of fish-eating birds and mammals is not likely to occur for cadmium at concentrations in water below the, MPC calculated for aquatic organisms.

van Beelen, P., van Vlaardingen, P.L.A. and Fleuren-Kemilä, A.K. (1994), Toxic effects of pollutants on the mineralization of chloroform in river sediments. *Ecotoxicology and Environmental Safety*, **27** (2), 158-167.

Full Text: [E\Eco Env Saf27, 158.pdf](E/Eco%20Env%20Saf27,%20158.pdf)

Abstract: The influence of pollutants on the formation of 14CO2 from 3 micrograms/liter labeled chloroform was studied in anaerobic Dutch river sediments. All incubations were performed under anaerobic conditions. Addition of toxicants to sediment microcosms showed logistic dose-effect curves. The concentration giving 10% inhibition of the chloroform mineralization rate (IC10) was derived from these dose-effect curves. The IC10 values of added cadmium, chloropyrifos, benzene, mercury, or 1,2-dichloroethane were 1300, 1300, 140, 90, and 0.07 mg/kg dry sediment, respectively. Mud samples taken at different dates from the same site indicated a significantly different sensitivity to added pentachlorophenol and zinc. The IC10 of added pentachlorophenol was 150 mg/kg in one and 15 mg/kg in another sample. Chloroform-mineralizing bacteria are very sensitive to addition of zinc. The IC10 of added zinc was 700 mg/kg for one sample and 11 mg/kg for another sample of the sediment which contained a background concentration of 800 mg Zn/kg. Therefore, a partial inhibition of the mineralization of chloroform by the high concentrations of zinc present in Dutch river sediments cannot be excluded. The high concentration of zinc might cause persistence of otherwise biodegradable pollutants in Dutch sediments.

Chen, H.F. and Hee, S.S.Q. (1995), Ketone EC50 values in the Microtox test. *Ecotoxicology and Environmental Safety*, **30** (2), 120-123.

Full Text: [E\Eco Env Saf30, 120.pdf](E/Eco%20Env%20Saf30,%20120.pdf)

Abstract: The Microtox EC50 values for the following ketones are reported in the following homologous series: straight chain methyl ketones (acetone, 2-butanone, 2-pentanone, 2-hepatonone, 2-octanone, 2-decanone, and 2-tridecanone), methyl ketones substituted at one alpha carbon (3-methyl-2-butanone, 3,3-dimethyl-2-butanone), methyl substituted at two alpha carbons (2,4-dimethyl-3-pentanone, 2,2,4,4-tetramethyl-3-pentanone), phenyl groups replacing methyl in acetone (acetophenone, benzophenone), methyl groups substituted at the alpha carbons of cyclohexanone, and 2,3-2,4-, and 2,5-hexanediones, most for the first time. While there were linear relationships between log EC50 and MW for the straight chain methyl ketones, and for methyl substitution at the alpha carbon for methyl ketones, there were no other linear relationships. As molecular weight increased, the EC50 values of soluble ketones decreased, as distance between two carbonyl groups decreased so too did EC50 values. Thus, for the ketones the geometry around the carbonyl group is an important determinant of toxicity as well as MW, water solubility, and octanol/water coefficient.

Traas, T.P., Luttik, R. and Jongbloed, R.H. (1996), A probabilistic model for deriving soil quality criteria based on secondary poisoning of top predators. I. Model description and uncertainty analysis. *Ecotoxicology and Environmental Safety*, **34** (3), 264-278.

Full Text: [E\Eco Env Saf34, 264.pdf](E/Eco%20Env%20Saf34,%20264.pdf)

Abstract: In previous studies, the risk of toxicant accumulation in food chains was used to calculate quality criteria for surface water and soil. A simple algorithm was used to calculate maximum permissable concentrations [MPC = no-observed-effect concentration/bioconcentration factor (NOEC/BCF)]. These studies were limited to simple food chains. This study presents a method to calculate, MPCs for more complex food webs of predators. The previous method is expanded. First, toxicity data (NOECs) for several compounds were corrected for differences between laboratory animals and animals in the wild. Second, for each compound, it was assumed these NOECs were a sample of a log-logistic distribution of mammalian and avian NOECs. Third, bioaccumulation factors (BAFs) for major food items of predators were collected and were assumed to derive from different log-logistic distributions of BAFs. Fourth, MPCs for each compound were calculated using Monte Carlo sampling from NOEC and BAF distributions. An uncertainty analysis for cadmium was performed to identify the most uncertain parameters of the model. Model analysis indicated that most of the prediction uncertainty of the model can be ascribed to uncertainty of species sensitivity as expressed by NOECs. A very small proportion of model uncertainty is contributed by BAFs from food webs. Correction factors for the conversion of NOECs from laboratory conditions to the field have some influence on the final value of, MP C5, but the total prediction uncertainty of the, MPC is quite large. It is concluded that the uncertainty in species sensitivity is quite large. To avoid unethical toxicity testing with mammalian or avian predators, it cannot be avoided to use this uncertainty in the method proposed to calculate, MPC distributions. The fifth percentile of the, MPC is suggested as a safe value for top predators.

Spurgeon, D.J. and Hopkin, S.P. (1996), Effects of metal contaminated soils on the growth, sexual development and early cocoon production of the earthworm *Eisenia fetida*, with particular reference to zinc. *Ecotoxicology and Environmental Safety*, **35** (1), 86-95.

Full Text: [E\Eco Env Saf35, 86.pdf](E/Eco%20Env%20Saf35,%2086.pdf)

Abstract: Juvenile Eisenia fetida (Savigny) were exposed for 20 weeks to an uncontaminated soil and to soils contaminated with cadmium, copper, lead and zinc collected from seven sites at different distances from a smelting works at Avonmouth, southwest England. The survival, growth (= weight after 5 weeks exposure), time to sexual maturation (= percentages of adults present after 8 weeks) and reproduction (= number of cocoons produced by the worms) were compared with soil metal concentrations. of the parameters measured, growth and sexual maturation time had the lowest EC (50) values. The effects of metal-contaminated soils could be attributed both to the direct toxicity of the metals and to changes in the “scope for growth” of the exposed worms. A comparison of the results with those of an earlier toxicity test conducted with adult worms indicated that juveniles are more sensitive to metals than adults. Significant toxic effects on the growth and sexual maturation times of juveniles were detected in soils from sites for which no significant effects on the cocoon production of adults could be detected. The greater sensitivity of juvenile worms indicates the importance of considering effects on a variety of life history stages when conducting a risk assessment of the effects of pollutants in soils. Although E. fetida does not occur naturally in soils at Avonmouth, the present study provides evidence to support the suggestion that pollution from the smelter is responsible for the absence of worms within 2 km of the factory. Results presented in this paper and from previous studies, suggest the observed absence is due to the effects of zinc on the growth and maturation of juveniles and the cocoon production rate of adult worms.

Kalf, D.F., Crommentuijn, T. and van de Plassche, E.J. (1997), Environmental quality objectives for 10 polycyclic aromatic hydrocarbons (PAHs). *Ecotoxicology and Environmental Safety*, **36** (1), 89-97.

Full Text: [E\Eco Env Saf36, 89.pdf](E/Eco%20Env%20Saf36,%2089.pdf)

Abstract: Environmental quality objectives (EQOs) for water, soil, and sediment are derived for polycyclic aromatic hydrocarbons (PAHs). EQOs are an important instrument in the effects-oriented environmental policy of the Dutch Ministry of the Environment. These EQOs should be set in such a way that protection of organisms in all compartments is ensured. As intermedia transport of chemicals occurs, this means that EQOs derived for individual compartments have to be harmonized. EQOs are based on scientifically derived risk limits: maximum permissible concentrations (MPCs) and the negligible concentrations (NCs)., MPCs are concentrations above which the risk of adverse effects is considered unacceptable. The NC is defined as the, MPC/100 and takes possible effects of combination toxicity due to the presence of other substances into account. In this paper, MPCs are derived for haphthalene, anthracene, phenanthrene, fluoranthene, benzo[a]anthracene, chrysene, benzo[k]fluoranthene, benzo[a]pyrene, benzo[ghi]perylene, and indeno[1, 2,3-cd]pyrene. The, MPCs for these PAHs are for water 1.2, 0.07, 0.30, 0.30, 0.01, 0.34, 0.04, 0.05, 0.03, and 0.04 micrograms/liter, respectively, for soil 0.14, 0.12, 0.51, 2.6, 0.25, 10.7, 2.4. 0.26, 7.5, and 5.9 mg/kg, respectively, and for sediment 0.14, 0.12, 0.51, 2.6. 0.36, 10.7, 2.4, 2.7, 7.5, and 5.9 mg/kg, respectively.

Struijs, J., van de Meent, D., Peijnenburg, W.J.G.M., van den Hoop, M.A.G.T. and Crommentuijn, T. (1997), Added risk approach to derive maximum permissible concentrations for heavy metals: How to take natural background levels into account. *Ecotoxicology and Environmental Safety*, **37** (2), 112-118.

Full Text: [E\Eco Env Saf37, 112.pdf](E/Eco%20Env%20Saf37,%20112.pdf)

Abstract: A unified method is presented to derive maximum permissible concentrations (MPCs) of xenobiotic and naturally occurring substances. The method relies upon risk limitation expressed as the maximum potentially affected fraction of all possible species (PAFmax) in a component ecosystem, due to a bioavailable concentration of the considered substance. For xenobiotic compounds the method is simplified to the “HC5 approach, “ i.e., the, MPC equals the hazardous concentration at which 5% of the species are unprotected. If the natural background of a substance is (partly) bioavailable, the related background effect, also expressed as PAF, is taken into account in deriving a, MPC. Examples are given and, MPCs for zinc, chromium, cadmium, copper, and lead for different levels of bioavailability in water are developed.

Danse, I.R., Jaeger, R.J., Kava, R., Kroger, M., London, W.M., Lu, F.C., Maickel, R.P., McKetta, J.J., Newell, G.W., Shindell, S., Stare, F.J. and Whelan, E.M. (1997), Position paper of the American Council on Science and Health: Public health concerns about environmental polychlorinated biphenyls (PCBs). *Ecotoxicology and Environmental Safety*, **38** (2), 71-84.

Full Text: [E\Eco Env Saf38, 71.pdf](E/Eco%20Env%20Saf38,%2071.pdf)

Abstract: Polychlorinated biphenyls, or PCBs, were widely used in various industrial applications for their insulating and fire retardant properties. In the 1960s, PCBs were found in soil and water, and research confirmed that some PCB congeners degrade very slowly in the environment and can build up in the food chain. Two widespread poisoning episodes in Japan and Taiwan were initially attributed to the consumption of rice bran oil contaminated with PCBs. Although subsequent analysis suggested that toxic thermal degradation products of PCBs in the oil, rather than the PCBs, were responsible for the observed health effects, commercial production of PCBs in the United States was discontinued in 1979. Several regulatory and advisory agencies have categorized PCBs as animal carcinogens, however, studies of workers exposed to high doses of PCBs over long periods of time have not demonstrated an increased cancer risk. In fact, the only health effects that could be attributed to PCBs were skin and eye irritation. Recent studies of the possible effects of prenatal exposure to PCBs on neurodevelopment in infants and children have been criticized for methodological deficiencies. There is no conclusive evidence that PCB levels in the general population are causing intellectual deterioration in children exposed in utero. Some investigators have also suggested that PCBs and other chemicals in the environment can interfere with the body’s endocrine system, leading to infertility, certain types of cancer, and other hormone-related disorders. Evidence for estrogenic effects of environmental PCBs remains weak and circumstantial. The following actions are recommended: development of innovative, cost-effective remediation techniques, particularly for sites that are difficult to remediate (e.g., river sediments), and scientifically based improvements to risk assessment, to reduce the considerable uncertainty associated with PCB exposure to health effects in humans.

Keywords: Eating Sea Birds, Capacitor Manufacturing Workers, Macaca-Mulatta Monkeys, Irish Coastal Waters, Aroclor-1254 Ingestion, Molecular-Features, Breast-Cancer, Dichlorodiphenyl Dichloroethene, Toxicological Consequences, Dibenzofurans PCDFs

Peijnenburg, W.J.G.M., Posthuma, L., Zweers, P.G.P.C., Baerselman, R., de Groot, A.C., van Veen, R.P.M. and Jager, T. (1999), Prediction of metal bioavailability in Dutch field soils for the oligochaete *Enchytraeus crypticus*. *Ecotoxicology and Environmental Safety*, **43** (2), 170-186.

Full Text: [E\Eco Env Saf43, 170.pdf](E/Eco%20Env%20Saf43,%20170.pdf)

Abstract: Current risk assessment procedures ignore that variation in soil properties results in substantial differences for uptake and effects in organisms in different soils. In this contribution is presented the results of a study on the soil-related factors that modulate metal uptake and elimination by the oligochaete worm Enchytraeus crypticus. Uptake of Cd, Cu, Pb, and Zn was quantified in 20 Dutch field soils as a function of time. Uptake rate constants and equilibrium concentrations were estimated using compartment modeling. Internal metal concentrations varied less than the corresponding external levels. Zn and especially Cu provided the most extreme examples of this general behavior, which suggests regulation by the organism. Body residues by Cd increased linearly over time in 11 of the 20 soils studied, whereas in the remaining 9 soils equilibration of internal Cd levels was observed. CaCl2 extraction could be used to discriminate the 9 soils in which there is Pb accumulation from the 11 soils in which bioavailable Pb levels were too low to allow for uptake. Multivariate expressions that describe uptake rate constants and bioaccumulation factors as a function of soil characteristics were derived. pH and cation exchange capacity were the most important parameters. The formulae were very similar to those describing partitioning of metals over the solid and liquid phase of the soils, which suggests pore water-mediated uptake. A semi-mechanistic approach yielded further evidence of pore water-related uptake, modulated by competition between H+ and metal ions at the active sites of the membranes. Copyright 1999 Academic Press.

Nakamura, K., Naruse, I. and Takizawa, Y. (1999), A new mass screening method for methylmercury poisoning using mercury-volatilizing bacteria from Minamata Bay. *Ecotoxicology and Environmental Safety*, **44** (1), 100-104.

Full Text: [E\Eco Env Saf44, 100.pdf](E/Eco%20Env%20Saf44,%20100.pdf)

Abstract: A simplified mass screening method for methylmercury exposure was developed using methylmercury-volatilizing bacteria from Minamata Bay. Some bacteria can transform methylmercury into mercury vapor. Most mercury in the hair is methylmercury, which is readily extracted with HCl solution. Black spots are formed on X-ray film due to the reduction of Ag (+) emulsion with mercury vapor produced by methylmercury-volatilizing bacteria. By exploiting these characteristics, a screening method was developed, whereby the fur of rats injected with methylmercury chloride formed clear black spots on X-ray film, whereas the fur of rats injected with saline did not. Subsequently, 50 human hair samples were examined using this mass screening method. The method identified people who had high mercury concentration, over 20 microg/g. A few thousand hair samples may be screened in a day using this method because it is rapid, simple, and economical. This method, therefore, enables screening of persons with methylmercury poisoning in mercury-polluted areas. Copyright 1999 Academic Press.

Hamilton, S.J. and Lemly, A.D. (1999), Water-sediment controversy in setting environmental standards for selenium. *Ecotoxicology and Environmental Safety*, **44** (3), 227-235.

Full Text: [E\Eco Env Saf44, 227.pdf](E/Eco%20Env%20Saf44,%20227.pdf)

Abstract: A substantial amount of laboratory and field research on selenium effects to biota has been accomplished since the national water quality criterion was published for selenium in 1987. Many articles have documented adverse effects on biota at concentrations below the current chronic criterion of 5 microg/L. This commentary will present information to support a national water quality criterion for selenium of 2 microg/L, based on a wide array of support from federal, state, university, and international sources. Recently, two articles have argued for a sediment-based criterion and presented a model for deriving site-specific criteria. In one example, they calculate a criterion of 31 microg/L for a stream with a low sediment selenium toxicity threshold and low site-specific sediment total organic carbon content, which is substantially higher than the national criterion of 5 microg/L. Their basic premise for proposing a sediment-based method has been critically reviewed and problems in their approach are discussed.

Keywords: Minnow Pimephales-Promelas, Sucker Xyrauchen-Texanus, 3 Endangered Fishes, San-Juan River, Razorback Sucker, Hazard Assessment, Quality Criteria, Irrigation Drainwater, Toxicity Thresholds, Colorado Squawfish

Peijnenburg, W.J., Baerselman, R., de Groot, A.C., Jager, T., Posthuma, L. and van Veen, R.P. (1999), Relating environmental availability to bioavailability: Soil-type-dependent metal accumulation in the oligochaete Eisenia andrei. *Ecotoxicology and Environmental Safety*, **44** (3), 294-310.

Full Text: [E\Eco Env Saf44, 294.pdf](E/Eco%20Env%20Saf44,%20294.pdf)

Abstract: Body residues are often better estimates of the amount of a chemical at the sites of toxic action in an organism than ambient soil concentrations, because bioavailability differences among soils are explicitly taken into account in considerations of body residues. Often, however, insufficient attention is paid to the rate and extent at which tissue concentrations respond to soil concentrations and soil characteristics. In this contribution the impact of soil characteristics on the environmental bioavailability of heavy metals for the oligochaete worm Eisenia andrei is reported. Uptake of As, Cd, Cr, Cu, Ni, Pb, and Zn in 20 Dutch field soils and in OECD artificial soil was quantified as a function of time. Internal metal concentrations varied less than the corresponding external levels. Metal uptake and elimination were both metal-and species-dependent. Worms typically attained steady-state concentrations rapidly for Cr, Cu, Ni, and Zn. Internal concentrations similar to those in the cultivation medium, linearly increasing body concentrations, or steady-state internal concentrations well above those in the cultivation medium were found for As, Cd, and Pb. Multivariate expressions were derived to describe uptake rate constants, steady-state concentrations, and bioaccumulation factors as a function of soil characteristics. Soil acidity is the most important solid-phase characteristic modulating the availability of As, Cd, and Pb. Although additional semimechanistic calculations yielded evidence of pore-water-related uptake of Cd and Pb modulated by competition between H (+) and metal ions at the active sites of the membranes, the findings for Cr, Cu, Ni, and Zn point to additional influences, among which is probably regulation. Copyright 1999 Academic Press.

Hatvani, N. and Mécs, I. (2003), Effects of certain heavy metals on the growth, dye decolorization, and enzyme activity of *Lentinula edodes*. *Ecotoxicology and Environmental Safety*, **55** (2), 199-203.

Full Text: [E\Eco Env Saf55, 199.pdf](E/Eco%20Env%20Saf55,%20199.pdf)

Abstract: Various physiological parameters of *Lentinula edodes* (Shiitake) in the presence of nine heavy metal salts were investigated. The mycelial growth was highly sensitive to cadmium and mercury, but less sensitive to zinc, copper, and lead. This resistance can be particularly dangerous to humans in the case of edible fungi such as Shiitake because of the possible heavy metal accumulation during growth and fruiting body production. All of the tested heavy metals inhibited decolorization of the dye Poly R-478 and the production of manganese peroxidase to a greater extent than they inhibited growth. Interestingly, with the exception of iron, the addition of all heavy metal salts investigated led to the increase of laccase production. Apart from cadmium and iron, none of the heavy metals inhibited the in vitro enzyme activities in concentrations up to 3 mM. The results of this study indicated the applicability of L. edodes in biosorption technologies used in the removal of toxic metals from contaminated effluents and in bioremediation technologies designed to treat complex wastes contaminated with heavy metals in addition to other xenobiotics.

Keywords: *Lentinula edodes* (Shiitake), Manganese Peroxidase, Laccase, Heavy Metals, Poly R-478 Dye

? Srihari, V. and Das, A. (2008), Comparative studies on adsorptive removal of phenol by three agro-based carbons: Equilibrium and isotherm studies. *Ecotoxicology and Environmental Safety*, **71** (1), 274-283.

Full Text: [2008\Eco Env Saf71, 274.pdf](2008/Eco%20Env%20Saf71,%20274.pdf)

Abstract: The present study deals with the adsorption of phenol on carbon-rich black gram husk (BGH), green gram husk (GGH), and rice husk (RH). All these agro-wastes were collected from the local mills and physico-chemical treatments were carried out to improve their adsorption capacity. Batch studies were performed to evaluate the effect of various experimental parameters such as initial pH, contact time, adsorbent dosage, and initial phenol concentration (CO) of 100 mg/l. Optimum conditions for phenol removal were found to be at pH 5.1 (in the range 2-12), an adsorbent dosage of 0.5 g/l of solution and for an equilibrium time of 6 h. Equilibrium isotherms for the adsorption of phenol on BGH, GGH, and RH were analyzed by Freundlich, Langmuir, Temkin, Redlich-Peterson, and Dubinin-Radushkevich isotherm models. Redlich-Peterson isotherm was found to be the best representative for phenol-sorption on all the three adsorbents studied. (C) 2007 Elsevier Inc. All rights reserved.

Keywords: Activated Carbon, Adsorption, Aqueous-Solution, Bentonite, Black Gram Husk (BGH), Contact Time, Green Gram Husk (GGH) and Rice Husk (RH) Carbons, Isotherms, Peat, Phenol Removal, Residues, Rice Husk, Waste-Water

# Title: Edinburgh Medical and Surgical Journal

Full Journal Title: Edinburgh Medical and Surgical Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Cummin, W. (1827), Remarks on the medicinal properties of Madar and on the effects of bichromate potassium on the human body. *Edinburgh Medical and Surgical Journal*, **28**, 295-312.

# Title: Educacion XX1

Full Journal Title: Educacion XX1

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Gomez-Garcia, A., Ramiro, M.T., Ariza, T. and Granados, M.R. (2012), Bibliometric study of *Educacion XX1*. *Educacion XX1*, **15** (1), 17-41.

Full Text: 2012\Edu XX115, 17.pdf

Abstract: Bibliometric studies in science have recently acquired great relevance. The aim of this study is to undertake a bibliometric analysis of the Revista Educacion XX1 in the last ten years. This journal has been recently incorporated in the Web of Science, and we aim to revise the current status of it. For this reason, we have undertaken the analysis of a total of 89 articles, consulted in the electronic version of the journal, the IN-RECS database and Redalyc scientific information system, following a series of bibliometric indicators, some of the most relevant of them are: authorship index, authors s nationality, university of origin, language of publication, number of references per year on each article and number of downloads per paper, among others. Among the most prominent results of this research we can conclude that the predominant language used in this publication is Spanish, the authors are mostly of Spanish nationality the articles published in 2007 were the ones that most citations received, it exists a large percentage of references of articles published before 2000 and there does not exist any relation between the most cited papers and those which are most downloaded. Finally, the paper concludes pointing out some general guidelines aimed to promote the wider dissemination of this journal, its recognition as an international journal, the updating of the year of publication of the references, the affiliation of the authors, and also in relation to subject areas of education on which to publish.

Keywords: Affiliation, Analysis, Articles, Authors, Authorship, Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Bibliometric Studies, Citations, Criteria, Descriptive Study by Means of the Analysis of Documents, Dissemination, Education, Guidelines, Impact Factor, In-Recs Database, Indicators, Indicators, Information, Internationality Index, Journal, Papers, Psychiatry Journals, Psychology Journals, Publication, Publications, Recognition, Research, Science, Scientific Information, Scientific Production, Spanish Psychology, University, Update Index, Web, Web of Science

# Title: Education for Information

Full Journal Title: Education for Information

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Oppenheim, C. (1989), Infometrics 87 88 - Selected Proceedings of the 1St International-Conference on Bibliometrics and Theoretical Aspects of Information-Retrieval - Egghe, L, Rousseau, R. *Education for Information*, **7** (2), 175-176.

? Tudman, M., Milas, M., Tudorsilovic, N. and Boras, D. (1985), Bibliometric analysis of master theses in information sciences (Postgraduate studies in librarianship, archivistics, museology and information-science, 1961-1984, Zagreb, Yugoslavia). *Education for Information*, **3** (4), 291-306.

Full Text: 1985\Edu Inf3, 291.pdf

Keywords: Bibliometric

# Title: Educ Med Salud

(Educ. Med. Salud.)

Full Journal Title:

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Elmendorf, M.L. (1982), Women-the underused human resource: Education and training of women for community participation. *Educ Med Salud*, **16** (4), 463-483.

Abstract: This article goes beyond the rhetorical issue of women’s participation as a key to implementing water supply and sanitation projects and suggests concrete ways in which training and education can make these plans a reality. With the improvements proposed for the International Drinking Water Supply and Sanitation Decade, women could be freed to do other tasks vital to the well being of the family and the community. Women, the “invisible resource” of society, play and essential part in encouraging family members to use technological advances and should be trained to effectively promote their acceptance. The author highlights the influence women have in the field of public health: with adequate training, for example, they can help control the spread of diarrheal disease with proper hygiene and an understanding of the fecal-oral route of infection. Moreover, she says that the central role women play in socializing the young and their permanence within the household make them suitable as trainees and trainers for water and sanitation projects at the community and household levels. Women should be recruited for these roles and should be consulted at every stage of development, while women’s bureaus exist in many countries, the author states that planners often hesitate to call on them for assistance. The article describes several innovative training programs and, along with a bibliography, presents separate case studies for Mexico and Panama.

# Title: Educational Administration Quarterly

Full Journal Title: Educational Administration Quarterly

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0013-161X

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Richardson, J.W. and McLeod, S. (2009), Where should educational leadership authors publish to get noticed by the top journals in the discipline? *Educational Administration Quarterly*, **45** (4), 631-639.

Full Text: [2009\Edu Adm Qua45, 631.pdf](2009/Edu%20Adm%20Qua45,%20631.pdf)

Abstract: Purpose: The current study seeks to understand which journals have been recently cited by scholars publishing in the field of educational leadership (i.e., specifically publishing in Educational Administration Quarterly [EAQ] and Journal of School Leadership [JSL]). Method: The researchers recorded the name and number of occurrences of journals that appeared in the bibliographies of articles published in EAQ and JSL from 2000 to 2007. The total counts for EAQ and JSL were combined to reach a final count. All journals then were rank ordered according to frequency. Findings: Five main findings were noted in the current study. First, it was found that authors who contribute to these journals tend to reference a different set of periodicals compared to those that professors of educational leadership say they actually read. Second, two of the leading journals (EAQ and JSL) in the field of educational leadership may be reaching unique audiences. Third, of the top 25 cited journals, slightly more than one third of the articles cited in EAQ and JSL from 2000 to 2007 were published in those two journals. Fourth, 4 of the top 15 most cited journals are practitioner journals. Finally, the findings show where educational leadership authors should publish to get their work noticed by top scholars in the field. Conclusion: The current study adds a valuable factor influencing authors’ choices of journals in which to publish their work: a journal’s citation frequency. The citation patterns noted in the current article will help authors consider issues of spread and replicability when seeking suitable outlets to publish their scholarly work.

Keywords: Bibliometrics, Citation Analysis, Citation Comparison, Educational Leadership, Periodicals

# Title: Educational Gerontology

Full Journal Title: Educational Gerontology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Rachal, J.R., Hemby, K.V. and Grubb, R.E. (1996), Institutional publication productivity in selected gerontology journals, 1984-1993. *Educational Gerontology*, **22** (3), 281-291.

Full Text: [1996\Edu Ger22, 281.pdf](1996/Edu%20Ger22,%20281.pdf)

Abstract: Researchers in several disciplines have been, interested in institutional research publication productivity as a means of assessing institutional reputation in a given field. However, no previous research has specifically examined institutional productivity, in the field of gerontology. The authors selected six non-medical, non-biological scholarly journals devoted to gerontological issues. Each was examined issue by issue for the la-year period 1984-1993 to determine the institutional affiliations of contributing authors. Institutional rankings for the composite six journals fbr the total period and each of the two 5-year periods were determined by awarding credit to the authors’ institutions based on authorship order. The six journals were: Activities, Adaptation, and Aging; Educational Gerontology; The Gerontologist; Gerontology and Geriatrics Education; the Journal of Applied Gerontology; and the Journals of Gerontology (Social Sciences and Psychological Sciences sections only). In the composite of the six journals, the University of Michigan (Ann Arbor), the University of Southern California, Duke University, Pennsylvania State University, and the University of Florida emerged as the five most productive individual institutions for the overall 10-year period on this one measure of program quality.

Keywords: Adaptation, Aging, American-Psychological-Association, Authors, Authorship, Education, Journal, Journals, Productivity, Psychological, Publication, Publication Productivity, Quality, Rankings, Research, Researchers, Scholarly Journals, Sciences, Social Sciences, University

# Title: Educational Record

Full Journal Title: Educational Record

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0013-1873

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Smith, R. and Fiedler, F.E. (1971), The measurement of scholarly work: A critical review of the literature. *Educational Record*, **52** (3) 225-232.

Abstract: A critical review of the literature is concerned with the measurement of scholarly work done by the faculties of universities and colleges. Such measures of output as individual and departmental ratings by scholars, the amount of recognition awarded, the number of publications written, and the number of citations to published work, are discussed and compared. Reference is made to studies that present empirical findings relating these measures to one another.

# Title: Educational Research

Full Journal Title: Educational Research

ISO Abbreviated Title: Educ. Res.

JCR Abbreviated Title: Educ Res-UK

ISSN: 0013-1881

Issues/Year: 3

Journal Country/Territory: England

Language: English

Publisher: Routledge

Publisher Address: Customer Services Dept, Rankine Rd, Basingstoke, Hants RG24 8PR, England

Subject Categories:

Education & Educational Research: Impact Factor 0.898, 67/184 (2010)

? Peritz, B.C., Teitelbaum, R. and Sor, D. (1989), *Educational Research* in Israel: A bibliometric survey, 1974-85. *Educational Research*, **31** (1), 59-64.

Keywords: Bibliometric

Arenas, J.L.D., Valles, J. and Arenas, M. (2000), Educational research in Mexico: Socio-demographic and visibility issues. *Educational Research*, **42** (1), 85-90.

Full Text: [E\Edu Res42, 85.pdf](E/Edu%20Res42,%2085.pdf)

Abstract: Socio-demographic and bibliometric techniques were used to investigate factors which are associated with the visibility of Mexican educational researchers accredited as national researchers by the National Researchers System (SNI). The SNI CD-Rom was used to analyse their socio-demographic data. We also searched major educational databases: British Education Index, Canadian Education Index, ERIC, Arts & Humanities Search and Social SCISearch in order to determine researchers’ performance in terms of their visibility. The results showed not only the researchers’ impact, but also the areas of educational research carried out in Mexico. Socio-demographic characteristics were identified.

Keywords: Educational, Research, Bibliometrics, Mexico

# Title: Educational Research and Review

Full Journal Title: Educational Research and Review

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: UUniversity

? Usang, B., Basil, A., Lucy, U. and Franca, U. (2007), Academic staff research productivity: A study of Universities in South-South Zone of Nigeria. *Educational Research and Review*, **2** (5), 103-108.

Full Text: [2007\Edu Res Rev2, 103.pdf](2007/Edu%20Res%20Rev2,%20103.pdf)

Abstract: This study examined academic staff research productivity in Universities in South-South zone of Nigeria. Ex post facto design was adopted for this study. Three hypotheses were formulated to guide this study. The sample size comprised of 480 academic staff drawn from a population of 3120. Data collection was carried out using a researcher – constructed instrument called Academic Staff Research Productivity Inventory (A.S.R.P.I.), which was validated and pilot tested. The data obtained were treated statistically using Independent t-test and contingency Chi-square (X2) analyses. Results indicated that male and female academic staff differed significantly in their research productivity; married and single academic staff differed significantly in their research productivity and there is a significant influence of areas of specialization on academic staff research productivity. It was recommended that academic staff in universities should be encouraged to carry out research work irrespective of their gender, marital status and areas of specialization.

Keywords: Academic Staff, Research Productivity, South South Zone, Nigerian Universities

# Title: Educational Studies

Full Journal Title: Educational Studies

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Yazici, A., Yazici, S. and Erdem, M.S. (2011), Faculty and student perceptions on college cheating: evidence from Turkey. *Educational Studies*, **37** (2), 221-231.

Abstract: Investigation of academic dishonesty has increased markedly in the past two decades; however, the body of research offers inconclusive evidence for many variables. This study examines faculty and student perceptions of in-class and out-of-class cheating behaviours and provides contextual evidence for the prevalence of assessment practices used. Faculty and students differed only slightly in their attitudes toward collegiate cheating and their views on possible reasons for it. We found that the prevalence of teaching and assessment types used in student grading is significantly correlated with perceptions of out-of-class cheating, but not with out-of-class cheating behaviours. Students with less experience in out-of-class assessment display a less ethical attitude toward out-of-class cheating.

Keywords: Academic Dishonesty, Academic Dishonesty, Assessment, Attitudes, Behavior, Cheating, Classroom, Codes, Contextual Influences, Determinants, Higher Education, Plagiarism, Plagiarism, Research, Students, Turkey

# Title: Educational Technology & Society

Full Journal Title: Educational Technology & Society

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Batane, T. (2010), Turning to turnitin to fight plagiarism among university students. *Educational Technology & Society*, **13** (2), 1-12.

Abstract: This paper reports on a pilot project of the Turnitin plagiarism detection software, which was implemented to determine the impact of the software on the level of plagiarism among University of Botswana (UB) students. Students’ assignments were first submitted to the software without their knowledge so as to gauge their level of plagiarism. The results recorded the average level of plagiarism among UB students to be 20.5%. The software was then introduced to the students and they were warned that their second assignments would be checked through the software. The results showed a 4.3% decrease in the level of plagiarism among students. A survey was conducted to find out the reasons why students plagiarise and also get the participants’ views on the use of the software to fight plagiarism. To win the fight against plagiarism, the paper recommends that the university adopt a more comprehensive approach in dealing with the problems that addresses, among other things, the fundamental reason why students plagiarise.

Keywords: Assignments, Plagiarism, Plagiarism Detection, Social Cognitive Theory, Students, Survey, Turnitin, University

? Liu, X.J., Liu, S.J., Lee, S.H. and Magjuka, R.J. (2010), Cultural differences in online learning: International student perceptions. *Educational Technology & Society*, **13** (3), 177-188.

Abstract: This article reports the findings of a case study that investigated the perceptions of international students regarding the impact of cultural differences on their learning experiences in an online MBA program. The study also revealed that online instructors need to design courses in such a way as to remove potential cultural barriers, including language, communication tool use, plagiarism, time zone differences and a lack of multicultural content, which may affect international students’ learning performances. The study indicates that a culturally inclusive learning environment needs to consider diversity in course design in order to ensure full participation by international students.

Keywords: Case-Based Learning, Cultural Differences, Design, Diversity, Environment, Instruction Design, Learning, Online Learning, Plagiarism, Students

# Title: Effluent and Water Treatment Journal

(Effluent water treat. J., Eff. wat. tre., EWTJA)

Full Journal Title: Effluent and Water Treatment Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Fish, H. (1973), Control of water rewources quality: Administrative aspects. *Effluent and Water Treatment Journal*, **13**, 31-42.

Stones, T. (1977), Fate of metals during sewage treatment. *Effluent and Water Treatment Journal*, **17**, 653-655.

# Title: Eighteenth-Century Studies

Full Journal Title: Eighteenth-Century Studies

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Wright, J.K. (2004), On Jean-Jacques Rousseau, considered as one of the first authors of the Revolution. *Eighteenth-Century Studies*, **37** (4), 677-682.

Full Text: [2004\Eig-Cen Stu37, 677.pdf](2004/Eig-Cen%20Stu37,%20677.pdf)

# Title: Eighth Wuhan International Conference on E-Business

Full Journal Title: Eighth Wuhan International Conference on E-Business

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Lou, Y., Fu, X.Y. and Huang, L.C. (2009), The commercialization prospect analysis of intelligent control in municipal wastewater treatment system based on bibliometrics. *Eighth Wuhan International Conference on E-Business, Vols I-III*, 857-862.

Abstract: Intelligent control technology in Municipal Wastewater treatment system has uncertain characteristics of technology development and commercial prospect, it is of great significance for technology investment decision-making that how to judge the commercial outlook of new technology. In this paper, we first introduced bibliometrics and its technical management functions. Then, we used bibliometrics to determine the maturity of the intelligent control technology in Municipal Wastewater treatment system. Finally, we analyzed the commercial environment and clarified the degree of commercialization.

Keywords: Bibliometrics, Commercial Prospect, Commercialization Prospects, Fuzzy-Control, Intelligent Control, Management, Removal, Wastewater Treatment

# Title: Einstein: The First Hundred Years

? Cawkell, A.E. and Garfield, E. (1980), Assessing Einstein’s impact on today’s science by citation analysis. In *Einstein: The First Hundred Years*, Eds. Goldsmith, M., Mackay, A. and Woudhuysen, J., Oxford, 31-40.

Full Text: [1960-80\Ein Fir Hun Yea, 31.pdf](1960-80/Ein%20Fir%20Hun%20Yea,%2031.pdf)

# Title: Ekonomicky Casopis

Full Journal Title: Ekonomicky Casopis

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Jemala, M. (2010), Foresight in second and third phase of globalization. *Ekonomicky Casopis*, **58** (8), 838-855.

Abstract: The main objective of this paper is dynamically to outline the evolution of Foresight in the 2(th) and 3(rd) phase of Globalisation The key mission here is to characterize partial determiners and circumstances that have conducted the evolution of this pervasive R&D planning method, together with broader participation and changing focus of Foresight over the time The general hypothesis is that Foresight has evolved like the consequence of increasing uncertainties that bring Globalisation and technical progress, and it is the specific form of strategic participative planning The new discoveries are analysed here by an extensive literature review and comparisons, and also based on the Bibliometrical analysis of the European Foresight Monitoring Network database The scope of this theme and the diversity of specialists opinions do not allow performing too specific analyses The main approach here is to identify the main development of Foresight in relations to several key historical events in the 2(th) and 3(rd) phase of Globalisation as well as to outline several mutual linkages.

Keywords: Analysis, Database, Development, Evolution, Forecasting, Generations of Foresight, Globalization, Literature, Literature Review, Network, Phases of Globalisation, R&D, Review, Uncertainties

# Title: Ekonomiska Samfundets Tidskrift

Full Journal Title: Ekonomiska Samfundets Tidskrift

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0013-3183

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Sarafoglou, N. (2006), How to measure productivity and how productive are Swedish professors in economics? Research evaluation by using quantitative and qualitative indicators. *Ekonomiska Samfundets Tidskrift*, **59** (2), 95-??.

Abstract: Research is central to a knowledge based society. However, almost as important as research itself, is the evaluation of this research. Reseach evaluation may contribute valuable information to colleagues, the public and the policy community. The purpose of this article is to evaluate the research output of the professors in economics in Sweden (quantity and quality) by using information from international bibliometric databases. The issue of the evaluation-sensibility with respect to the choice of methods of evaluation is also discussed.

Keywords: Community, Core Journals, Databases, Economics, European Economics, Evaluation, Indicators, Information, Knowledge, Methods, Output, Policy, Productivity, Qualitative, Quality, Quantity, Relative Impacts, Research, Sweden

# Title: Eksperimentalnaya Onkologiya

Full Journal Title: Eksperimentalnaya Onkologiya

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Ketko, E.G. and Suptelo, L.P. (1993), An analysis of modern trends in the development of ecological oncology (scientometrics of information flows). *Eksperimentalnaya Onkologiya*, **15** (3), 74-79.

Abstract: The scientometrical analysis of the world and home information flows on ecological oncology for the period of 1979-1989 has been carried out. The characteristic features of the structure of ecooncological investigations and the dynamics of the information flows in individual directions were found out. Results of the scientometric analysis should be taken into consideration in the planning and coordination of scientific investigations in ecooncology to avoid their dubbing and to be in line with the world tendencies.

? Ketko, E.G. (1994), Totality of publications devoted to the influence of chemical carcinogens on natural ecosystems (scientometric analysis). *Eksperimentalnaya Onkologiya*, **16** (4-6), 317-325.

Abstract: The scientometric analysis of the world and the former USSR publications on some chemical carcinogenic substances in the environment for a period from 1979 to 1989 has been carried out, The characteristics of the structure of investigations of this scientific problem were found out. Results of the scientometric analysis should be taken into consideration in the organization and planning of scientific researches in ecological oncology with the aim to rise a priority of investigations.

# Title: Electoral Studies

Full Journal Title: [Electoral Studies](http://www.sciencedirect.com/science/journal/02613794)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0013-4694

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Crisp, B.F., Jensen, K.M. and Shomer, Y. (2007), Magnitude and vote seeking. *Electoral Studies*, **26** (4), 727-734.

Full Text: [2007\Ele Stu26, 727.pdf](2007/Ele%20Stu26,%20727.pdf)

Abstract: In one of the most frequently cited articles published in Electoral Studies, Carey and Shugart [Cary, J.M., Shugart, M.S. 1995. Incentives to cultivate a personal vote: a rank ordering of electoral formulas. Electoral Studies 14(4), 417-439] hypothesized that the number of copartisans faced relative to seats available had a differential effect on the incentive to cultivate a personal vote de, pending on whether electoral rules allowed for intra-party competition. Across a wide array of electoral systems, we show that the number of candidates fielded per party varies within districts and that the variation is not systematically related to the total number of seats available. Thus, the widespread use of magnitude as a proxy for “copartisan crowdedness” is systematically inaccurate. We argue that the observed number of copartisans faced makes clear that a ratio to capture vote seeking incentives needs a party-in-a-district denominator to accompany the party-in-a-district numerator. That denominator is the expected number of seats to be won by each party in question. (C) 2007 Elsevier Ltd. All rights reserved.

Keywords: Copartisan Candidates, District Magnitude, Electoral Rules as Incentive Structures, Japan, Party Magnitude, Personal or Party Vote Seeking

# Title: The Electrician

Full Journal Title: The Electrician

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Terry, H. (1900), Action of water on pure indiarubber. *The Electrician*, **45**, 916-917.

Abstract: Hancock sealed a bag of pure rubber containing rather more than 12 oz. of water, and weighed it at intervals with the following results: Date Oct., 1826 Oct., 1827 Oct., 1835 Nov., 1844 Oct., 1849 Feb., 1851 May, 1854 Weight 17 oz. 4 dr. 17 oz. 2 dr. 16 oz. 0 dr. 14 oz. 12 dr. 13 oz. 4 dr. 7 oz. 8 dr. 3 oz. 14 dr. Their loss of weight occurred at atmospheric pressures. Obach gives 24 per cent. as the absorption of water by pure rubber in four months. Increasing the pressure to 8 atmospheres resulted in rubber absorbing in five minutes as much water as it otherwise takes up in two hours.

Keywords: Absorption, Water

# Title: Electroanalysis

Full Journal Title: [Electroanalysis](http://www3.interscience.wiley.com/journal/26571/home)

ISO Abbreviated Title: Electroanalysis

JCR Abbreviated Title: Electroanal

ISSN: 1040-0397

Issues/Year: 18

Journal Country/Territory: United States

Language: English

Publisher: Wiley-V C H Verlag GmbH

Publisher Address: Muhlenstrasse 33-34, D-13187 Berlin, Germany

Subject Categories:

Chemistry, Analytical: Impact Factor

? Neuhold, C., Kalcher, K., Diewald, W., Cai, X.H. and, Raber, G. (1994), Voltammetric determination of nitrate with a modified carbon-paste electrode. *Electroanalysis*, **6** (3), 227-236.

Full Text: [1994\Electroanalysis6, 227.pdf](1994/Electroanalysis6,%20227.pdf)

Abstract: A method for the voltammetric determination of nitrate in drinking water is presented. Nitrate exerts a catalytic effect on the reduction and reoxidation of thallium (1 <-> 0) in cyclic and differential pulse voltammetry leading to a peak enhancement. Nitrate can be preconcentrated together with tetrachlorothallate(III) from hydrochloric acid solutions onto a carbon paste electrode modified with a liquid anion exchanger (Amberlite LA2) under open circuit conditions. After reduction of the TI(III) to Tl(0) at the electrode surface at a potential of -1.2 V (vs. SCE), the increase of the reoxidation current of Tl(0) to Tl(I) by nitrate is exploited for analytical purposes. Linearity between current and concentration exists for 0.5 to 60 µg . mL-1 nitrate when applying anodic differential pulse voltammetry. Mechanical regeneration of the electrode surface is necessary after each measurement. The interference of other anions and the influence of methodical parameters are investigated. The applicability of this method for the determination of nitrate in drinking water is demonstrated. A concise overview on the electroanalytical techniques for the quantitative determination of nitrate is also presented.

Keywords: Nitrate, Carbon Paste, Modified Electrodes Catalysis, Pulse Polarographic-Determination, Ions, Behavior, Nitrite

Capelo, S., Mota, A.M. and Gonçalves, M.L.S. (1995), Complexation of lead with humic matter by stripping voltammetry. Prevention of adsorption on nafion-coated mercury film electrode. *Electroanalysis*, **7** (6), 563-568.

Full Text: [1995\Electroanalysis7, 563.pdf](1995/Electroanalysis7,%20563.pdf)

Abstract: The complexation of humic matter with lead in natural water conditions was studied by differential pulse anodic stripping voltammetry (DPASV) using a mercury film of a Nafion-coated mercury film as the working electrode. The results clearly show that the Nafion film greatly minimizes the adsorption of humics on the electrode. Besides adsorption, other effects on the voltammetic signal are discussed, such as the degree of lability, ligand heterogeneity and the metal-to-ligand concentration ratio at the electrode surface.

? Pehlivan, E., Richardson, A. and Zuman, P. (2004), Electrochemical investigation of binding of heavy metal ions to Turkish lignites. *Electroanalysis*, **16** (16), 1292-1298.

Full Text: [2004\Electroanalysis16, 1292.pdf](2004/Electroanalysis16,%201292.pdf)

Abstract: Adsorption and desorption of Cu2+, Ph2+, Cd2+, Ni2+ and Zn2+ ions on samples of lignites (young brown coal) from three areas in the vicinity of Konya (Anatolia, Turkey) were followed using the polarographic method of analysis. This method enables the determination of free metal ions in suspensions containing both small and colloidal particles of lignite. Effects of pH, nature of the metal ion, and origin of the lignite on its adsorption capacity were followed. Binding is only between 5 and 30% reversible, indicating that ion exchange is not the predominant factor. The role of the size and shape of cavities inside pulverized lignite and of the functional groups inside these cavities was considered.

Keywords: Adsorption, Celluloses, Copper(II), Heavy Metal Ion-Binding, Heterogeneous Systems - Analysis, Lignite, Polarography, Sorptions, Wood, Zinc(II) Ions

? Keuth, U., Leinenbach, A., Beck, H.P. and Wagner, H. (1998), Separation and characterization of humic acids and metal humates by electrophoretic methods. *Electroanalysis*, **19** (7), 1091-1096.

Full Text: [1998\Electroanalysis19, 1091.pdf](1998/Electroanalysis19,%201091.pdf)

Abstract: A modified buffer for the separation of humic acids (HA) by capillary zone electrophoresis (CZE) was studied. The addition of hydroxycarboxylic acids to berate buffer makes a more efficient separation of HA possible. Two sharp peaks are obtained. Preparative isolation of these two fractions can be reached by applying the conditions used in CZE to free-flow electrophoresis (FFE). The fractions obtained were characterized by repetition of the CZE procedure. Also metal complexes of HA were investigated by electrophoretic methods. In the presence of metal cations, HA form stable complexes of different electrophoretic mobility. These complexes can be separated by free-flow isotachophoresis (FF-ITP). The different fractions are analyzed by CZE, ultraviolet-visible and atomic absorption spectrometry. Significant changes in both the ITP-pattern of the FFE and the ‘humic hump’ in CZE demonstrate the influence of complexation on the macromolecules.

Keywords: Free-Flow Electrophoresis, Capillary Zone Electrophoresis, Humic Acids, Metal Humates, Capillary Zone Electrophoresis, Fulvic-Acid, Substances, Complexation, Isotachophoresis, Model, Ions

? Li, Y.H., Wang, Y.X. and Huang, M.H. (2008), Determination of trace vanadium by adsorptive stripping voltammetry at a carbon paste electrode. *Electroanalysis*, **20** (13), 1440-1444.

Full Text: [2008\Electroanalysis20, 1440.pdf](2008/Electroanalysis20,%201440.pdf)

Abstract: A method for the voltammetric determination of vanadium using a carbon paste electrode (CPE) was described. The new procedure is based on the adsorptive accumulation of the V(V)-alizarin red S(ARS) complex onto the surface of the CPE, followed by the electrochemical reduction of adsorbed species. The optimal experimental conditions include the use of 0.10 mol/L acetate buffer (pH 5.1), 1.0 x 10(-5) mol/L ARS, an accumulation potential of -0.10 V (versus SCE), an accumulation time of 2 min, a scan rate of 200 mV/s and a second-order derivative linear scan mode. The reduction peak for the complex appears at -0.52 V. The peak current is proportional to the concentration of V(V) over the range of 0.10 - 15.0 mu g/L, and the detection limit is 0.04 mu g/L for a 2 min adsorption time. The relative standard deviations(n = 8) for 2.0 and 0.50 mu g/L V(V) are 3.1 and 4.7%, respectively The proposed method was applied to the determination of vanadium in water samples.

Keywords: Acetate, Adsorption, Adsorptive Voltammetry, Alizarin Red S, Bromate, Carbon, Carbon Paste Electrode, Experimental, Mercury Drop Electrode, pH, Potential, Red-S-Complex, Reduction, Second Order, Second-Order, Standard, Stripping, System, Vanadium, Water

# Title: Electrochemical Industry

Full Journal Title: Electrochemical Industry

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Mott, W. (1904), Colloidal precipitation on aluminium electrodes. *Electrochemical Industry*, **2**, 444-447.

Abstract: The mode of formation of the insulating film on aluminium is considered in the light of the general phenomena of colloidal precipitation. Solutions of chromates, phosphates, tartrates, &c., strongly precipitate colloidal Al/sub 2/H/sub 6/O/sub 6/. The same electrolytes produce insulating films on Al anodes having absorptive properties similar to those observed in colloidal precipitation. These facts suggest that film formation at an Al anode and colloidal precipitation are allied phenomena. The composition of the film is discussed. The rival theories regard this as (1) a sub-oxide of aluminium, (2) oxide (Al/sub 2/O/sub 3/) of aluminium, (3) hydrate of aluminium, and (4) a basic aluminium salt. The history of these theories is given, and the conclusion is reached that the insulating film consists of aluminium hydrates combined with basic salts of aluminium. The opinion has been advanced by Wilson and Norden that A/sub 2/H/sub 6/O/sub 6/ is first formed and then this reacts with the electrolyte to take up the acid radical. Taylor and Inglis (Phil. Mag., vol. 5, pp. 301-313, March 1903) have shown that a film of hydroxide can be substituted for the metal anode. They deposited the hydroxide in the walls of a porous cup and then with this membrane between Pt electrodes they reproduced the peculiarities of the Al anode. It is concluded that aluminium hydroxide is first produced on the Al anode and this reacts with the electrolyte. The phenomenon of taking up the acid radical is called “/b adsorption/”. Al/sub 2/H/sub 6/O/sub 6/ as precipitated by ammonia from a chloride solution is in a loose and flocculent form, easily soluble, but when left standing for a long time in contact with sulphate solutions it becomes more and more insoluble in acids and even alkalies. This slow chemical process takes place with great rapidity at an Al anode. The loose hydroxide is there compacted into a dense, very hard, insoluble film of great specific resistance and high dielectric strength. The /b solidifying/ effect of different electrolytes is next considered in detail. Citric acid, which is trivalent, has extreme precipitating power, and films formed in citrates at 20 volts are much thinner than those formed in sulphates. Generally electrolytes containing /b acid radicals of high valency/ give high critical voltages and films of great specific resistance and high dielectric strength, and so thinner films are obtained requiring less coulombs for their formation.

Keywords: Aluminium, Chloride, Metal, Phosphates, Solution

# Title: Electrochemistry Communications

Full Journal Title: [Electrochemistry Communications](http://www.sciencedirect.com/science/journal/13882481)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Nakade, S., Saito, Y., Kubo, W., Kanzaki, T., Kitamura, T., Wada, Y. and Yanagida, S. (2003), Enhancement of electron transport in nano-porous TiO2 electrodes by dye adsorption. *Electrochemistry Communications*, **5** (9), 804-808.

Full Text: [2003\Ele Com5, 804.pdf](2003/Ele%20Com5,%20804.pdf)

Abstract: Influence of dye adsorption on electron transport in nano-porous TiO2 electrodes filled with electrolytes is studied with various TiO2 films and electrolytes. Electron diffusion coefficient in the electrodes is derived from pulsed laser induced current transients. It is found that dye adsorption increases the diffusion coefficients in the electrodes regardless of the difference of electrolytes and TiO2 electrodes. The degree of the increases scales with the surface area of the nano-porous electrodes. Based on trapping model, these observations can be interpreted with that the charge traps located on the electrode surface are removed by the dye adsorption. However, dependency of electron diffusion coefficients on light intensity is not affected by dye adsorption, implying that the traps are located not only on the surface but also inside the electrodes. (C) 2003 Elsevier B.V. All rights reserved.

Keywords: Dye Adsorption, TiO2, Nano-Porous, Electron Diffusion, Charge Traps, Nanocrystalline Solar-Cells, Photoelectrochemical Cells, Nanoporous TiO2, Photocurrent, Films, Efficiency, Diffusion, Size

# Title: Electrochimica Acta

Full Journal Title: [Electrochimica Acta](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5240&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=e46383c6e01345325790b717298bc020)

ISO Abbreviated Title: Electrochim. Acta

JCR Abbreviated Title: Electrochim Acta

ISSN: 0013-4686

Issues/Year: 20

Journal Country/Territory: England

Language: Multi-Language

Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Electrochemistry: Impact Factor

Conway, B.E. and M. Salomon, M. (1964), Electrochemical reaction orders: Applications to the hydrogen- and oxygen-evolution reactions. *Electrochimica Acta*, **9** (12), 1599-1615.

Full Text: [E\Ele Act9, 1599.pdf](E/Ele%20Act9,%201599.pdf)

Abstract: The problem of deduction of electrochemical reaction orders is discussed for two- and multi-step reactions, particularly for conditions under which the type of isotherm (*eg* Langmuir and Temkin) governing the adsorption of electrochemically formed intermediates *eg* H, and OH and O in the hydrogen- and oxygen-evolution reactions, respectively, may change with the extent of coverage. In multi-step reactions, the reaction orders can lead to distinction of kinetic pathways under Temkin adsorption conditions where Tafel slopes can be ambiguous. The reaction orders also depend on the relative coverages by the two intermediates OH and O usually considered in the oxygen-evolution reaction. Applications are made to experimental data for the hydrogen evolution reaction at Pt and Hg. For the latter metal, reaction-order considerations render the H2+-ion -discharge mechanism unlikely as also indicated by H/D separation-factor calculations. The slow H2+-ion-neutralization mechanism is shown to lead to dia chemisorbed and not in equilibrium with H2+ ions in solution.

Takahash, K. (1968), Application of cole-cole plot to study of adsorption kinetics at mercury/electrolyte-solution interface. *Electrochimica Acta*, **13** (7), 1609-1621.

Full Text: [E\Ele Act13, 1609.pdf](E/Ele%20Act13,%201609.pdf)

Abstract: The interfacial impedance was measured at the interface between mercury and aqueous electrolyte solutions containing some organic surface-active substances. The frequency dispersion of the interfacial impedance associated with the adsorption––desorption process of the organic substances was analysed by the method of Cole and Cole. The shapes of the Cole––Cole plot have been put into two groups, and the physical meaning of each group is explained in terms of the adsorption kinetics. Under certain conditions, the rate of adosrption of octyl- or decyl-sulphate ions is controlled by an activation process, whereas the adsorption of alcohols is controlled by the rate of diffusion.

Electrical equivalent circuits have been determined for the two kinds of adsorption––desorption process.

Rampazzo, L. (1969), Diffusion to a plane with adsorption according to Frumkin’s isotherm. *Electrochimica Acta*, **14** (8), 733-739.

Full Text: [E\Ele Act14, 733.pdf](E/Ele%20Act14,%20733.pdf)

Abstract: This paper considers the problem of the kinetics of adsorption at the electrode/solution interphase, for a substance which does not undergo chemical or electrochemical reactions. The differential system which describes semi-infinite linear diffusion to a plane has been examined, assuming that at the boundary a generic isotherm holds. In this way one arrives at a Volterra integral equation which in general is non-linear. The numerical solution of such an equation has been carried out for the case of a Frumkin isotherm. The coverage of the electrodedouble dagger μ = Γ/Γ*m* as a function of the adimensional quantity log *z* [ = log (*C*\*24*Dt*/Γ*m*2π)] depends on the parameters β*C*\* = ψ and *A* of the isotherm. The relative graphs allow us to determine the time required to arrive at a fixed coverage. The effects of attractive and repulsive interactions are discussed.

Damjanov, A. and Genshaw, M.A. (1970), Dependence of kinetics of O2 dissolution at Pt on conditions for adsorption of reaction intermediates. *Electrochimica Acta*, **15** (7), 1281-1283.

Full Text: [E\Ele Act18, 1281.pdf](E/Ele%20Act18,%201281.pdf)

Mekjavić, I. and Lovreček, B. (1971), Adsorption of phenol and kinetics of electrode processes on Bi amalgam electrode. *Electrochimica Acta*, **16** (8), 1201-1212.

Full Text: [E\Ele Act18, 1201.pdf](E/Ele%20Act18,%201201.pdf)

Abstract: The kinetics of dissolution and deposition of bismuth on the Bi amalgam electrode in perchloric acid with and without the presence of phenol has been investigated galvanostatically.

By analysis of the kinetic parameters it has been established that the mechanism of dissolution and deposition processes of bismuth are, in the presence of phenol, the same as in the pure solution, but they occur at higher overvoltages, dependent of the phenol concentration. This is attributed to the adsorption of phenol on the electrode surface, by which the effective cd is increased. From the shift of the ηA/log *i* curve in solutions with phenol the degree of surface coverage has been determined, the coverage data fit the Langmuir adsorption isotherm over a wide range of phenol concentrations.

In systems with phenol and also chloride, phenol still blocks the surface, and the process occurs with an effectively increased cd on the places occupied by chloride, which, however, maintains its activating effect.

Chatfield, C.J., Sherlock, J.C. and Shreir, L.L. (1972), Calculation of interaction parameters between species adsorbed at an electrode/electrolyte-solution interface. *Electrochimica Acta*, **17** (2), 351-359.

Full Text: [E\Ele Act17, 351.pdf](E/Ele%20Act17,%20351.pdf)

Abstract: A general theory for the calculation of interaction parameters between adsorbed species at an electrode/electrolyte-solution interface is derived and presented in a form suitable for use in conjunction with chronocoulometric studies. The theory has been applied to the adsorption of ions on a Ni single crystal, and good agreement with experimental results is obtained. It is also shown that the approximate solution to the Elovich equation can lead to considerable errors in the calculation of interaction parameters.

Kohlmayr, G. and Stonehar, P. (1973), Adsorption kinetics for carbon-monoxide on platinum in hot phosphoric-acid. *Electrochimica Acta*, **18** (2), 211-223.

Full Text: [E\Ele Act18, 211.pdf](E/Ele%20Act18,%20211.pdf)

Abstract: The availability and activity of platinum electrocatalyst sites for oxidation of the hydrogen in reformed natural gas has been one of the problems associated with efficient utilization of the platinum-anode catalyst. The major anode catalyst poison is carbon monoxide and the mechanism of poisoning of the hydrogen reaction by carbon monoxide has been reported.

The equilibrium adsorptions and the rates of adsorption of CO on platinum surfaces were studied at a series of *p*co values between 0.01 and 0.10 atm in 96 per cent H3PO4 between 105 and 148°C. This range of partial pressures of CO is expected within an operating fuel cell.

The adsorption isotherms are explicable in terms of single-site adsorption of the carbon monoxide molecule on the platinum surface atoms, causing a slow anion adsorption at the unpoisoned platinum sites. The equilibrium coverages for carbon monoxide on the platinum surfaces are independent of temperature in the range studied. Adsorption equations are used to describe the coverages of the platinum surface by carbon monoxide so that extrapolation of the data to both higher and lower carbon monoxide partial pressures gives reliable estimates of the resultant surface coverages.

Dhar, H.P., Conway, B.E. and Joshi, K.M. (1973), On the form of adsorption isotherms for substitutional adsorption of molecules of different sizes. *Electrochimica Acta*, **18** (11), 789-798.

Full Text: [E\Ele Act18, 789.pdf](E/Ele%20Act18,%20789.pdf)

Abstract: Adsorption from solution occurs by solvent displacement in the interphase. When the adsorbate differs appreciably in size from the previously adsorbed solvent, the relative size factor (*x*) of adsorbate and solvent determines (*a*) the form of the relation for free energy of adsorption and (*b*) the form of the configurational function in terms of fractional coverage θ or site fraction *X*. Various types of isotherms that have been proposed for this situation are critically compared in relation to the statistics of the solvent-lattice replacement process that occurs in adsorption, *eg*, of organic substances at electrodes. It is concluded that the correct configurational term to be used when *x* > 1 is θ/*ex-1* (1 - θ)*x*. Using this term in an equilibrium adsorption isotherm then allows standard free energies of adsorption and derived quantities to be properly calculated from experimental coverage or surface excess measurements.

It is shown that it is strictly incorrect to refer to an isotherm containing the configurational term θ/*x*(1 - θ)*x* as the “Flory––Huggins isotherm, “ since Flory––Huggins statistics leads to an isotherm having a different form for the configurational term, *viz* that containing *ex-1*, as above.

For adsorption of molecules for which *x* > 1, failure to include the size factor term in the isotherm leads to errors in the evaluation of any interaction effects in the adsorption behaviour.

Conway, B.E., Angerstein-Kozlowska, H., and Dhar, H.P. (1974), On selection of standard states in adsorption isotherms. *Electrochimica Acta*, **19** (8), 455-460.

Full Text: [E\Ele Act19, 455.pdf](E/Ele%20Act19,%20455.pdf)

Abstract: The question of choice of appropriate standard states for adsorbed phases at electrode interfaces is reviewed and examined in relation to solvent displacement and the Langmuir and Flory-Huggins types of adsorption isotherms. Comparison with the situation for gas/solid adsorption is made. Standard potentials for electrochemisorption are considered for electrochemical isotherms with and without interaction/heterogeneity terms.

Grubitsch, von H. and Zlatanovic V. (1975), Die kinetik der sauerstoffadsorption aus wässrigen perchloratlösungen an silber. *Electrochimica Acta*, **20** (10), 731-738.

Full Text: [E\Ele Act20, 731.pdf](E/Ele%20Act20,%20731.pdf)

Abstract: Oxygen was adsorbed on silver surfaces from aqueous perchlorate solutions of different pH. The adsorbed amount of oxygen was measured by cathodic stripping. Determinations of the adsorbed oxygen after different adsorption times showed the validity of the Elovich-equation for the adsorption rate.

The roughness factor of the used surfaces (prepared by wet grinding on SiC paper 600 mesh) was found to be 3.33 by measurements of the double layer capacity relative to an electropolished silver sphere. Assuming equal distribution of the (111), (110), (100) planes in the surface and planar adsorption of the oxygen molecule, the maximum coverage was found between 0.25 (neutral solutions) and 0.075 (ph 1). The adsorption rate was measured at 25°, 50°, 75°C in solutions of pH 0.85, saturated with 100%, 50%, 21% oxygen. Evaluation of the Elovich-equation gave an apparent activation energy between 0 and 4 Kcal/mol, corresponding to a Van der Waals’ type adsorption.

Coeuret, F. (1976), L’electrode poreuse percolante (epp). I. Transfert de matiere en lit fixe. *Electrochimica Acta*, **21** (3), 185-193.

Full Text: [E\Ele Act21, 185.pdf](E/Ele%20Act21,%20185.pdf)

Abstract: The mass transfer coefficient between a fixed bed of spherical particles and a liquid flowing at low Reynolds numbers has been experimentally determined with a Percolating Porous Electrode. The method used is based on the reduction of ferricyanide ions on a cathode consisting of a fixed bed of spherical conducting grains. A correction for the current feeder efficiency allows the calculation of the mass transfer coefficient by means of a mass balance in the electrode which acts as a plug flow reactor.

The parameters studied in the experiments were the bed height, the electrolyte flow rate and the Schmidt number. The following empirical correlation: Imagehas been established 0, 04 < *Rep* < 30 and 1700 < *Sc* < 11000.

For a value of *Sc* = 1000 this correlation is in good quantitative agreement with other correlations from the literature.

Stonehart, P. and Ross, P.N. (1976), Use of porous-electrodes to obtain kinetic rate constants for rapid reactions and adsorption-isotherms of poisons. *Electrochimica Acta*, **21** (6), 441-445.

Full Text: [E\Ele Act21, 441.pdf](E/Ele%20Act21,%20441.pdf)

Notes: highly cited

? Janssen, M.M.P. and Moolhuysen, J. (1976), Platinum-tin catalysts for methanol fuel cells prepared by a novel immersion technique, by electrocodeposition and by alloying. *Electrochimica Acta*, **21** (11), 861-868.

Full Text: [1960-80\Ele Act21, 861.pdf](1960-80/Ele%20Act21,%20861.pdf)

Abstract: A novel technique has been developed for the preparation of platinum—tin electrodes. In essence, it consists in covering a properly pretreated platinum surface with a fraction of a monolayer of tin without the use of electrical current. Best results are achieved by immersing a hydrogen-covered platinum electrode into an aqueous tin solution. High surface tin coverages lead to passivation at low potentials in methanol oxidation. The optimal activity per unit of real surface area is about the same platinum—tin electrodes prepared by the immersion technique as for those obtained by conventional electrodeposition and by partial corrosion of Pt---Sn alloys, which indicates that conventional Pt---Sn electrodes can only be improved by using higher dispersions.

Notes: highly cited

? Janssen, M.M.P. and Moolhuysen, J. (1976), Binary systems of platinum and a second metal as oxidation catalysts for methanol fuel cells. *Electrochimica Acta*, **21** (11), 869-878.

Full Text: [1960-80\Ele Act21, 869.pdf](1960-80/Ele%20Act21,%20869.pdf)

Abstract: A large number of platinum based binary catalysts has been prepared by deposition of submonolayer amounts of the second components onto the surface of platinum catalysts via an immersion method. Of the hitherto unknown systems, platinum—titanium showed an activity close to that of the best systems known so far, viz platinum—tin and platinum—ruthenium. The various systems could be classified according to their electrosorption behaviour. It was found that the group of catalysts exhibiting redox behaviour at low potential were not more active than pure Pt, although this would be expected if the redox mechanism for enhanced methanol oxidation was valid. Highest activity was observed for systems displaying stabilization of the adsorbed second element in the zero—valent state and hence modified Pt adsorption behaviour. These observations suggest that an adsorption mechanism could account for the effect of the second metal.

Olive, H. and Lacoste, G. (1979), Application of volumetric electrodes to the recuperation of metals in industrial effluents. I. Mass transfer in fixed beds of spherical conductive par. *Electrochimica Acta*, **24** (10), 1109-1114.

Full Text: [E\Ele Act24, 1109.pdf](E/Ele%20Act24,%201109.pdf)

Abstract: The study deals with the mass transfer in an electrochemical reactor for the recovery of copper, using a flow through porous electrode technique. It is performed in an electrolysis cell made up of spherical particles covered with copper and percolated by a dilute sulfuric acid solution of Cu2+ ions.

The determination of mass transfer coefficients is possible if the value of the material yield is known. The latter is calculated from the measurement of inlet and outlet concentrations determined by spectrophotometry.

The geometric parameters (diameter of particles and heigh of bed) and hydrodynamic parameters (flow over the particles) have been scanned. These results related to those obtained by authors who investigated the influence of the viscosity solution suggest the correlation. Sh = 4.3 Re0.35 Sc0.25 for Reynolds numbers between 0.1 and 3.

Grchev, T., Cvetkovska, M., Stafilov, T. and Schultze, J.W. (1991) Adsorption of polyacrylamide on gold and iron from acidic aqueous-solutions. *Electrochimica Acta*, **36** (8), 1315-1323.

Full Text: [E\Ele Act36, 1315.pdf](E/Ele%20Act36,%201315.pdf)

Abstract: The adsorption behaviour of polyacrylamide (PAA) on gold, and mild steel from sulphuric and hydrochloridic acid was studied using cyclic voltammetry with simultaneous monitoring of the double layer capacity. Adsorption isotherms, obtained by capacity measurements (using the two-condenser model), and corresponding thermodynamic parameters of the adsorption processes strongly depend upon the molecular mass of the polymer, electrode potential and temperature. In all cases the experimentally-obtained results show the best fit with Frumkin’s isotherm (Langmuir and Flory-Huggins isotherms were tested as well). It was found that nearly complete coverage (theta = 1) can be reached at extremely low polymer concentrations in the solution (10-8-10-7 m) which can be explained by a significant participation of the directly attached segments of the polymer molecules (trains) at the metallic surface and weak lateral interactions. The conclusion was proved by comparison of the polymer adsorption with the adsorption behaviour of the monomer itself. Capacity measurements predict flat orientation of the polymer molecules at the metal/solution interface with an average thickness of the adsorbed layer of about 0.8 nm. Thermodynamic parameters of the polymer adsorption on gold, at low anodic potentials, are comparable with those obtained from corrosion measurements on iron and mild steel. At high anodic potentials adsorption of PAA on gold is an endothermic process which can be explained by a substitutional adsorption (Polym(aq) + xH2O(s) = Polym(s) + xH2O(aq) and conformation changes of the adsorbed polymer molecule. Thus, the calculated values of DELTA-H(ads)0 and DELTA-S(ads)0 correspond to the whole process, adsorption of polymer molecules and desorption of x-water molecules per polymer molecule.

Keywords: Adsorption of Polyacrylamide, Acidic Aqueous Medium, Gold and Iron Surfaces, Capacity Measurements, Corrosion Protection, Corrosion, Inhibition, Steel

Nart, F.C. and Iwasita, T. (1992), 2nd-order stark-effect of adsorbed sulfate-ions on polycrystalline platinum. *Electrochimica Acta*, **37** (12), 2179-2184.

Full Text: [E\Ele Act40, 2179.pdf](E/Ele%20Act40,%202179.pdf)

Abstract: A second order Stark effect was observed for the first time both on the band center frequency and on the integrated band intensity of sulfate ions adsorbed at polycrystalline platinum. It was observed that, as the applied potential grows towards positive values, the band frequency is shifted upwards and the integrated band intensity decreases, suggesting that the applied electric field produces bond constrictions of the uncoordinated SO2 group. Lateral interactions were also observed. The adsorption isotherm that best fit the results is the one of Temkin. An adsorption in the form of islands is suggested in order to explain the lateral interaction and the validity of the Temkin isotherm.

Keywords: Anion Adsorption, Stark Effect, Adsorption Isotherm, Ftir Spectroscopy, Double Layer, Metal-Surface, Spectroscopy, Electrode, Adsorption, Ftir, Interphase, Absorption, Molecules, Sioh, Sih

Zhang, X.G., Arikawa, T., Murakami, Y., Yahikozawa, K. and Takasu, Y. (1995), Electrocatalytic oxidation of formic-acid on ultrafine palladium particles supported on a glassy-carbon. *Electrochimica Acta*, **40** (12), 1889-1897.

Full Text: [E\Ele Act40, 1889.pdf](E/Ele%20Act40,%201889.pdf)

Abstract: The effect of particle size of ultrafine palladium particles on the electrochemical oxidation of formic acid in a perchloric acid solution has been investigated by cyclic voltammetry (CV) and differential electrochemical mass spectroscopy (DEMS). Except in the hydrogen sorption-desorption region, only carbon dioxide was observed by the DEMS as an oxidation product, and the profile of the i(mass)-E curve was in fair agreement with that of i-E curves. With a decrease in the palladium particle size, the specific activity of the palladium particles for the oxidation of formic acid gradually increased until ca. 3 nm in the mean diameter, and then it steeply decreased.

Keywords: Ultrafine Particle, Formic Acid, Dems, Electrochemical Oxidation, Palladium, Noble-Metal Electrodes, Irreversibly Adsorbed Adatoms, Online Mass-Spectroscopy, Methanol Oxidation, Heterogeneous Electrocatalysis, Platinum Particles, Organic-Molecules, Sulfuric-Acid, Adsorption, Monolayers

Gamez, A., Richard, D., Gallezot, P., Gloaguen, F., Faure, R. and Durand, R. (1996), Oxygen reduction on well-defined platinum nanoparticles inside recast ionomer. *Electrochimica Acta*, **41** (2), 307-314.

Full Text: [E\Ele Act41, 307.pdf](E/Ele%20Act41,%20307.pdf)

Abstract: The objective of the study was to investigate the effect of particle size on the catalytic activity for oxygen reduction reaction at platinum/recast ionomer interface. To obtain experimental evidence of this effect, porous electrodes of well-defined geometry and very well calibrated Pt particles on graphite were used. The catalytic powders were prepared by cationic exchange and characterised by TEM and H and CO electrochemical adsorptions. For oxygen reduction, a loss of catalytic activity with the decreased platinum particle size is confirmed. This activity loss is correlated to the stronger adsorption of oxygenated species under inert atmosphere and during oxygen reduction. No effect of the inter-particles distance was found even when the particles are 1.2nm in diameter and about 10nm away, the use of graphite powder also prevents a too strong shielding effect of the catalyst support.

Keywords: Oxygen Electroreduction, Particle Size Effect, Platinum, Graphite Substrate, Particle-Size, Electrodes, Catalyst, Kinetics

De Leon, C.P. and Pletcher, D. (1996), The removal of Pb(II) from aqueous solutions using a reticulated vitreous carbon cathode cell: The influence of the electrolyte medium. *Electrochimica Acta*, **41** (4), 533-541.

Full Text: [E\Ele Act41, 533.pdf](E/Ele%20Act41,%20533.pdf)

Abstract: The removal of Pb(II) ions from aqueous solutions of perchlorate, nitrate, tetrafluoroborate, chloride and sulfate, pH 2, has been investigated in a cell with a reticulated vitreous carbon cathode. It is confirmed that the Pb(II) may always be removed. There are, however, marked differences in the conditions necessary and the performance attained by the system (*eg*, rate of removal, current efficiency), even with these nominally similar, aqueous acid media. The origin of these differences are investigated.

Keywords: Three Dimensional Electrodes, Effluent Treatment Reduction of Pb(II), Metal-Ion Removal, Process Streams, Flow-Through, Adsorption

Retter, U. (1996), Modeling of 2D first-order phase transitions in adsorption layers at the metal/electrolyte interface. *Electrochimica Acta*, **41** (14), 2171-2174.

Full Text: [E\Ele Act41, 2171.pdf](E/Ele%20Act41,%202171.pdf)

Abstract: Several organic substances exhibit 2D first-order phase transitions in their adsorption at the metal/electrolyte interface. This phenomenon is discussed on the basis of the Ising lattice gas model. Firstly, its predictions are summed up concerning the critical behaviour of adsorption layers (phase diagrams, critical exponents). Secondly, the mean-field approximation and the quasi-chemical approximation for condensed adsorption layers are investigated critically. In conclusion, low-temperature series expansions of the degree of coverage are found to be adequate isotherms.

Ahmed, M.E., Ibrahim, M.S., Temerk, Y.M. and Kawde, A.M. (1996), Adsorption and association of xanthine in absence and presence of some divalent metal ions at the mercury/solution interface. *Electrochimica Acta*, **41** (18), 2883-2892.

Full Text: [E\Ele Act41, 2883.pdf](E/Ele%20Act41,%202883.pdf)

Abstract: The adsorption and interfacial orientations of xanthine were studied by out-of-phase ac voltammetry at a hanging mercury drop electrode. The adsorption equilibrium and its attainment have been investigated as a function of various parameters such as pH, adsorption potential, temperature, adsorption time, the nature of anions of the supporting electrolyte and the bulk concentration of xanthine. The changes in the stacking interactions of xanthine molecules in the presence of Cd(II), Cu(II), Co(II), Ni(II), Ca(II) and Mg(II) were studied by ac voltammetry as changes in “pits” or “wells” on double layer capacitance curves due to adsorption and association of M(II)-xanthine complexes on the charged interface. The results indicate that the complexation of xanthine molecules enhances the stacking interactions and hence would be expected to facilitate the formation of perpendicularly stacked layer of M(II)-xanthine complex on the electrode surface. The time dependence of the electrode impedance indicates that the formation of a compact film in absence and presence of these metal ions controlled by a fixed number of nuclei and the data were analysed according to the Avrami equation. The adsorption parameters of xanthine have been computed at different pH values in the absence and the increased presence of metal ions.

Andonoglou, Ph.P. and Jannakoudakis, A.D. (1997), Palladium deposition on activated carbon fibre supports and electrocatalytic activity of the modified electrodes towards the hydrogen evolution reaction. *Electrochimica Acta*, **42** (12), 1905-1913.

Full Text: [E\Ele Act42, 1905.pdf](E/Ele%20Act42,%201905.pdf)

Abstract: In the present study, the creation of carbon fibre-Pd electrodes after several ion exchange-reduction procedures, is investigated. Ion exchange takes place between the H+ ions of the functional acidic groups of the electrochemically oxidized carbon fibres and the Pd2+ ions and is followed by chemical or electrochemical reduction of Pd2+ to Pd-0. The mixed C-Pd electrode systems are studied by cyclic voltammetry, scanning electron microscopy (SEM) and EDAX spectroscopy. The study is completed by impedance spectroscopic measurements at the potential of hydrogen evolution in H2SO4 solutions. The comparison of the SEM and EDAX micrographs shows that the chemically obtained C-Pd systems have a larger effective surface area. The low values of the charge transfer resistance, especially in the case of the chemical reduction, indicate the strong electrocatalytic properties of the prepared electrodes for the hydrogen evolution reaction. (C) 1997 Elsevier Science Ltd

Keywords: Absorption, AC Impedance, Adsorption, Aqueous-Solutions, Faradaic Reactions, Fiber Supports, Glassy-Carbon, Kinetics, Noble-Metal Catalysts, Particles

Lust, E., Janes, A., Lust, K., Sammelselg, V. and Miidla, P. (1997), Influence of surface pretreatment of bismuth and cadmium electrodes to the electric double layer and adsorption characteristics of organic compounds. *Electrochimica Acta*, **42** (19), 2861-2879.

Full Text: [E\Ele Act42, 2861.pdf](E/Ele%20Act42,%202861.pdf)

Abstract: Influence of the surface structure of electrodes on the electric double layer properties, as well as on the adsorption characteristics of various organic compounds has been investigated by cyclic voltammetry, impedance and electron microscopic methods at variously prepared Pi, Sb and Cd electrodes. The systematic trends of the influence of surface roughness and energetic inhomogeneity on the electric double layer characteristics (value of differential capacity, potential of diffuse minimum, Parsons-Zobel factor, inner layer capacity, roughness function) have been established. The dependencies of the shape of adsorption-desorption maxima of organic compounds and other adsorption parameters (values of attraction interaction, adsorption equilibrium constant, shape of adsorption isotherm) on the electrode surface structure have been investigated. The Debye-length dependent roughness function has been calculated. The approximate values of the linear parameter of homogeneous regions, which prevail at the surface of polycrystalline electrodes have been calculated using various theoretical models. The established values of linear parameters of homogeneous regions have been compared with the characteristics obtained from the electron microscopic studies. (C) 1997 Published by Elsevier Science Ltd.

Keywords: Bi, Sb, Cd, Polycrystal, Monocrystal, Surface Treatment, Surface Roughness, Organic Adsorption, Polycrystalline Electrode, Faces, Capacity, Crystal, Charge

Hanewinkel, C., Winkes, H., Schumacher, D. and Otto, A. (1997), Adsorption of metal cations precisely quantified by surface resistance of thin epitaxial silver film electrodes. *Electrochimica Acta*, **42** (20-22), 3345-3349.

Full Text: [E\Ele Act42, 3345.pdf](E/Ele%20Act42,%203345.pdf)

Abstract: Dc-resistance measurements of metal thin films can be used to investigate processes at the solid-vacuum and solid-electrolyte boundary. In electrochemistry this is a new method to determine the quantity of adsorbed species on solid electrodes. We have grown an epitaxial Ag (111) thin film electrode on a Si (111) substrate with stable characteristics under electrochemical conditions [1]. The adsorption and desorption of small quantities of metal cations from aqueous solutions leg 1 µM Pb2+) are detected by changes of the de-resistance, resulting from a diffuse scattering of conduction electrons by the adsorbates. In contrast to polycrystalline silver films epitaxial Ag (111) thin film electrodes allow us to perform many deposition and stripping cycles of lead-without changing the properties of the thin film.

Matsui, T. and Takeyama, K. (1998), Li+ adsorption on a metal electrode from glymes. *Electrochimica Acta*, **43** (10-11), 1355-1360.

Full Text: [E\Ele Act43, 1355.pdf](E/Ele%20Act43,%201355.pdf)

Abstract: The free energy profiles have been computed as Li+ approaches to a model electrode in dimethoxyethane (DME) and diglyme using Monte Carlo statistical mechanics simulations. For the approach of Li+ from the outer Helmholtz plane to the electrode, the free energy increases more rapidly in diglyme than in DME. The coordination numbers for Li+ are six for both the solvents, DME works as a bidentate ligand but diglyme works as a tridentate one. The configuration changes of the first solvation shell show that one DME molecule is shed for Li+ adsorption but not for diglyme. The presence of electrode hinders the motion of diglyme chains. The suitability of both the solvents for the models of polyethylene oxides are also discussed in this work.

Lovell, M.A. and Roy, D. (1998), Effects of sub-surface oxygen on electrodeposition of cadmium on copper. *Electrochimica Acta*, **43** (14-15), 2117-2130.

Full Text: [E\Ele Act43, 2117.pdf](E/Ele%20Act43,%202117.pdf)

Abstract: In aqueous media, the electrochemistry of Cu is complicated by surface layers of native oxides. It is difficult to experimentally control the growth of these oxide films. These oxides also penetrate into subsurface regions and interfere with other surface reactions. Here, we combine potential step experiments with numerical calculations to study such an interface in a neutral electrolyte of NaClO4. Both in situ and ex situ sources of surface oxidation are investigated. Electrodeposition of Cd2+ is studied in the presence of surface oxides on Cu. The deposition of Cd2+ and catalytic reduction of O-2 affect each other. This complicates direct coulometric measurement of the Cd-coverage. An alternative method is demonstrated to determine the coverage isotherm of electrodeposition under these conditions. A phenomenological framework is developed to characterize the electrochemical features of the unavoidable surface oxides of Cu. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Cadmium, Copper, Isotherm, Oxide Layer, UPD, Atomic-Force Microscopy, 2nd-Harmonic Generation, Underpotential Deposition, Electrochemical Reduction, Polycrystalline Copper, Alkaline-Solutions, Borax Buffer, Cu(III), Adsorption, Oxidation

Levi, M.D. and Aurbach, D. (1999), Frumkin intercalation isotherm: A tool for the description of lithium insertion into host materials: A review. *Electrochimica Acta*, **45** (1-2), 167-185.

Full Text: [E\Ele Act45, 167.pdf](E/Ele%20Act45,%20167.pdf)

Abstract: This paper offers an integrated approach toward the elucidation of electroanalytical behavior of various Li-insertion anodes and cathodes. Specifically, the paper describes the application of a Frumkin adsorption/intercalation type isotherm as a tool for a quantitative description of electrochemical Li intercalation/deintercalation into various Li-insertion anodes and cathodes. Common and distinguished properties of such an intercalation process in a host material and adsorption of the same species on a metallic interface are compared and discussed, taking into account a pronounced difference in the corresponding potential profiles across the cells and possible kinetical rate-determining steps. The application of an equation combining the Frumkin isotherm with the conventional Butler-Volmer kinetics is exemplified by electrochemical Li insertion/deinsertion to/from a thin graphite and LixCoO2 electrodes. Four major electroanalytical techniques, SSCV, PITT, GITT and EIS, are frequently used for the determination of chemical diffusion characteristics of Ei-ions. For these techniques, we have defined their characteristic time-invariant functions (Iv(-1/2), It(1/2), dE/dt(1/2) and A(w), respectively) to present the diffusion time constant tau Bs a combination of one of these functions with the differential intercalation capacitance, Ci, t. Such a presentation allows the above characteristic functions to be connected, and demonstrates the equivalence in application of the three differential techniques, PITT, GITT and EIS, for obtaining kinetic data. This conclusion was experimentally verified for a thin graphite anode and a LixNi0.8Co0.2O2 cathode. This verification may have an important implication for the judicious utilization of GITT in distinguishing between possible rate-determining steps of a first-order phase transition. A common feature on the experimental plots of the chemical diffusion coefficient of Li+, D vs, the potential observed for a variety of Li-insertion compounds, appears in the form of a deep minima corresponding to the peak values of the differential intercalation capacitance. Taking into account a limitation due to Li transfer across the particle/solution interface and the intercalation process described by a Frumkin intercalation isotherm, log D vs. E curves could be simulated for Li insertion electrodes. We can explain the deviation of the experimental current vs. time plots during a PITT of Li insertion electrodes from the theoretical plots in the long-time domain, in terms’ of the distribution in their particle size. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Electroactive Polymer-Films, Potentiostatic Intermittent Titration, Vanadium-Oxide Electrode, Linear Potential Sweep, Electrochemical Impedance, Graphite-Electrodes, Li Intercalation, Aprotic Media, Diffusion, Behavior

? Khan, A.A., Alam, M.M. and Mohammad, F. (2003), Ion-exchange kinetics and electrical conductivity studies of polyaniline Sn(IV) tungstoarsenate; (SnO2)(WO3)(As2O5)4(-C6H5-NH-)2 nH2O: A new semi-crystalline ‘polymeric-inorganic’ composite cation-exchange material. *Electrochimica Acta*, **48** (17), 2463-2472.

Full Text: [2003\Ele Act48, 2463.pdf](2003/Ele%20Act48,%202463.pdf)

Abstract: A new and novel electrically conducting ‘polymeric-inorganic’ composite cation-exchange material; polyaniline Sn(IV) tungstoarsenate was prepared by incorporating polyaniline into inorganic ion-exchanger material. It possessed improved ion-exchange capacity, high chemical and thermal stabilities, reproducibility and selectivity for some specific metal ions. Kinetic study of exchange for some divalent metal ions of alkaline earths and transition metals was carried out under the conditions favoring a particle diffusion-controlled ion-exchange phenomenon and some physical parameters such as self diffusion coefficient Do, energy of activation E, and entropy of activation DeltaS\* were determined. The temperature dependence of electrical conductivity of this’ composite material with increasing temperatures was measured by using 4-in-line-probe DC electrical conductivity measuring-technique. The conductivity values lie in the semiconductor region, i.e. in the range of 10(-3) S cm(-1) that follow the Arrhenius equation. The energy of activation of electrical conduction for the composite was also calculated. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Capacity, Cation Exchange, Cation-Exchanger, Diffusion, Electrical Conductivity, Exchange, Ion Exchange, Ion Exchange Kinetics, Ion-Exchange Kinetics, Kinetic, Kinetics, Membrane, Metal Ions, Nonlinear Diffusion Problem, Organic, Inorganic Nanocomposites, Phosphate, Polyaniline Sn(IV) Tungstoarsenate, Polymeric -Inorganic Composite Material, Semiconductor, Supported Zirconium(IV) Tungstophosphate, System, Temperature, Temperature Dependence

Inzelt, G. and Puskás, Z. (2004), Adsorption and precipitation during the redox transformations of phenazine. *Electrochimica Acta*, **49** (12), 1969-1980.

Full Text: [E\Ele Act49, 1969.pdf](E/Ele%20Act49,%201969.pdf) [E\Ele Act-Inzelt.pdf](E/Ele%20Act-Inzelt.pdf)

Abstract: The adsorption/desorption and deposition/dissolution phenomena occurring during the electrochemical transformations of phenazine (Ph) at a gold electrode in aqueous acidic solutions have been studied by cyclic and potential step electrochemical quartz crystal microbalance measurements. Phenazine exhibits two successive one-electron reduction steps in acidic media. In dilute phenazine solutions, the product of the first electron transfer is phenazylium cation radical (PhH2+) which adsorbs in the form of a phenazylium salt (PhH2+ClO4-, PhH2+Cl-) at the electrode surface. The perchlorate salt is highly soluble and the electroreduction takes place via a loosely adsorbed state. In chloride containing solutions, multilayer adsorption is observed. The second electron transfer in dilute phenazine solutions results in the formation of 5, 10-dihydrophenazine (PhH2) in HClO4, which desorbs from the electrode surface. In HCl solutions, a substantial portion of the fully reduced product, which is a charged dimer, remains on the surface. In more concentrated phenazine solutions in the potential region of the second reduction wave, a deposition process can be observed, which is due to the formation of the quinhydrone-analogue, phenazinehydrine charge-transfer complex. The formation of the charge-transfer complex obeys a second-order kinetics, however, the rate of the film growth is influenced by the simultaneous dissolution process. The increase of the acid concentration enhances the dissolution, and may prevent the film formation. In dilute phenazine solutions, both redox waves are reversible and likewise the adsorption/desorption processes. In concentrated solutions, the reoxidation of the phenazinehydrine film results in a complicated voltammetric response related to a dissolution–redeposition–dissolution sequence.

Keywords: Phenazine, Electrochemical Quartz Crystal Microbalance, Adsorption, Deposition, Phenazinehydrine Charge-Transfer Complex

Carneiro, P.A., Osugi, M.E., Sene, J.J., Anderson, M.A. and Zanoni, M.V.B. (2004), Evaluation of color removal and degradation of a reactive textile azo dye on nanoporous TiO2 thin-film electrodes. *Electrochimica Acta*, **49** (22-23), 3807-38200.

Full Text: [E\Ele Act49, 3807.pdf](E/Ele%20Act49,%203807.pdf)

Abstract: The feasibility of the photobleaching of a textile azo dye, reactive orange 16 (C.I. 17757), in aqueous solution using titanium dioxide thin-film electrodes prepared by the sol-gel method was investigated. The best conditions for maximum photoelectrocatalytic degradation were found to be pH > 10 for Na2SO4 medium and pH < 6 for NaCl. In both situations, an applied potential of +1.0 V and low dye concentration are recommended, when 100% of color removal is obtained after 20 min of photoelectrocatalysis. The effects of side reaction pathway on the degradation rate of dye in sulfate and chloride medium were presented and the best performance are optimized to situations closed to that verified in the textile effluent. The influence of variables as applied potential, pH, supporting electrolyte and dye concentration on the kinetics of photoelectrochemical degradation also were investigated. Oxalic acid is identified by HPLC and UV-Vis spectrophotometric methods as the main degradation product generated after 180 min of photoelectrocatalysis of 4×10-5) mol l-1 dye in sodium sulphate pH 12 and NaCl pH 4.0 and a maximum reduction of 56 and 62% TOC was obtained, respectively. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: TiO2 Thin-Film Electrode, Degradation of Reactive Dye, Photoelectrocatalysis, Dye Oxidation, Reactive Orange 16, Photocatalytic Degradation, Ceramic Membranes, Visible-Light, Formic-Acid, Waste-Water, Diazo Dye, Decolourization, Pollutants, Oxidation, Titania

? Trasatti, S. (2005), Impact Factor: The most cited papers of 2002. *Electrochimica Acta*, **51** (3), 385.

Full Text: 2005\Ele Act51, 385.pdf

Keywords: Impact, Impact Factor, Papers

? Baddini, A.L.D.Q., Cardoso, S.P., Hollauer, E. and Gomes, J.A.D.C. (2007), Statistical analysis of a corrosion inhibitor family on three steel surfaces (duplex, super-13 and carbon) in hydrochloric acid solutions. *Electrochimica Acta*, **53** (2), 434-446.

Full Text: [2007\Ele Act53, 434.pdf](2007/Ele%20Act53,%20434.pdf)

Abstract: Previous studies have addressed the experimental and theoretical investigation of the inhibition corrosion efficiencies (ICE) of single metal surfaces. Along this line we carried out calculations concerning to 23 compounds on three different single-steel surfaces, duplex, super-13 and the carbon steel in hydrochloric acid (15% w/v) solutions. The overall experiment is composed of 69 results of weight loss ICEs at 60°C for amines, alcohols, thiourea and its derivatives acting as corrosion inhibitors for three steel surfaces. In these studies ICEs were correlated with group and quantum AM1 descriptors through the use of three different statistical methodologies based on calibration and validation of regular and modified OLS and PLS (partial least squares) methods. All calculations have shown better results using weight isoesteric Langmuir adsorption function (WILA function), ln(theta M1(1 -0)) or In K-ads, calculated from the weight loss data as the response function. The function -log(i) has been used, as well, on all comparisons. Variables describing the metal were added to the previous set of group and quantum IC variables and several models have been designed to fit the three-steel problem. Simple products of metal and IC variables with 250 (25 x 10) products were tested as model I. Selection of the best variable set was carried out for the calibration and validation procedures and these calculations indicated very few descriptors in common, i.e. each particular selection (calibration or validation) finds its own optimal descriptor set. The overall results showed excellent correlations with R-2 values between 0.80 and 0.96 and a Q(2) values from 0.75 to 0.93. We are unaware of any similar QSPR study on the steels here studied, and neither the study of such massive amount of data concerning molecular inhibitors on three different steel surfaces. Our best result for the second-order cross-validation descriptor selection employs 29 variables, Y-29. The results accurately fitted all 69 corrosion inhibitors experiments within 5% accuracy over three different steel types. A second model was designed with all 630 binary products of the metal/IC interface (((35 + 1) x 35)/2). This model uses the variables of model I plus all simple squares of the primary data. Due to the large number of composed variables we carried out calculations based on the classical partial least squares (PLS). Our best result employed nine main components that accurately fitted the 69 corrosion inhibitors experiments with obtained calibration coefficients, R-2, values of 0.95 and Q(2) values of 0.83. Both results showed excellent performance compared to previous fits found in the literature. Most of the obtained results are easily transferable to other similar many-steel studies through a simple data addition concerning the new metal surface. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Cinnamaldehyde, Corrosion, Derivatives, HCl, Inhibitor, Iron, Mechanism, Model, OLS, PLS, Statistical Analysis

? Zhou, J.H., Deng, C.Y. and Si, S.H. (2010), Study on photocatalytic deposition of bismuth onto nanocrystalline TiO2 by quartz crystal microbalance and electrochemical method. *Electrochimica Acta*, **55** (17), 4995-4999.

Full Text: [2010\Ele Act55, 4995.pdf](2010/Ele%20Act55,%204995.pdf)

Abstract: In situ techniques of quartz crystal microbalance (QCM), differential pulse voltammetry (DPV) and ampermetric measurement were employed to investigate the adsorption Bi(III) ions and the photocatalytic deposition Bi process at the surface of nanocrystalline TiO2. It was obtained that the adsorption of Bi(III) ions onto nanocrystalline TiO2 accords with the pseudo-second-order reaction and the reaction rate constant k was about 13.3 g mol-1 min-1. In addition, the photocatalytic deposition of Bi onto the surface of TiO2 was further investigated. It was found that photocatalytic deposition rate at the surface of TiO2 was enhanced by increasing pH value or initial concentration of Bi(III) ions. The influence of organic hole-scavegeners on the photocatalytic deposition of Bi was also investigated, and it was obtained that formic acid may be the best for the photocatalytic reduction of Bi. The mass ratio between the Bi(III) and Bi metal deposition was calculated as 7.48:1. Therefore, it can be concluded that QCM, DPV and amperometric measurement may be effective and reliable for the investigation of the photocatalytic deposition of Bi onto the surface of nanocrystalline TiO2. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Acid, Adsorption, Anatase Titania, Aqueous Suspensions, Bi3+-TiO2, Bilirubin Adsorption, Bismuth, Cu(II), Differential Pulse Voltammetry, Films, Metal-Ions, Nanocrystalline Titanium Dioxide, Nanoparticles, Photocatalytic Deposition, Quartz Crystal Microbalance, Reduction, TiO2

? Qu, X.A., Tian, M., Liao, B.Q. and Chen, A.C. (2010), Enhanced electrochemical treatment of phenolic pollutants by an effective adsorption and release process. *Electrochimica Acta*, **55** (19), 5367-5374.

Full Text: [2010\Ele Act55, 5367.pdf](2010/Ele%20Act55,%205367.pdf)

Abstract: Phenolic compounds are the most prevalent pollutants in industrial wastewater. Here we report on a novel approach: using adsorption and release process to improve the efficiency of electrochemical oxidation of phenolic pollutants. To illustrate this innovative technique, three phenolic compounds, phenol, p-nitrophenol (p-NPh) and p-cresol, were selected as model pollutants. The adsorption studies were carried out by adsorbing the three pollutants onto a hyper-cross-linked resin (Purolite Macronet MN-200). The adsorption isotherms, adsorption kinetics and the effect of temperature on adsorption were systematically investigated. Our experimental results have shown that the MN-200 resin exhibits a high removal efficiency of the three model pollutants and the adsorbed phenolic compounds can be efficiently released in a NaOH solution. The preconcentrated phenolic compounds were further treated using electrochemical oxidation at the Ti/SnO2-Sb2O5-IrO2 electrode. The first-order model fits the kinetics data of the electrochemical oxidation very well, showing that the degradation rate constant decreases in the order of p-NPh > phenol > p-cresol. Our study has demonstrated that the integration of the effective preconcentration process and the advanced electrochemical oxidation offers a promising approach for the efficient elimination of phenolic pollutants in wastewater. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Adsorption Isotherms, Adsorption Kinetics, Anodes, Approach, Carbon, Data, Degradation, Efficiency, Electrocatalytic Oxidation, Electrochemical Oxidation, Electrodes, Experimental, First Order, First-Order Model, Industrial Wastewater, Integration, Isotherms, Kinetics, Mn200, Model, NaOH, Oxidation, P-Substituted Phenols, Phenol, Phenolic Compounds, Phenolic Pollutants, Pollutants, Preconcentration, Rate Constant, Red Mud, Release, Removal, Removal Efficiency, Resin, Rights, Solution, Temperature, Treatment, Waste-Water Treatment, Wastewater

? Zhou, J.H., Deng, C.Y., Si, S.H., Shi, Y. and Zhao, X.L. (2011), Study on the effect of EDTA on the photocatalytic reduction of mercury onto nanocrystalline titania using quartz crystal microbalance and differential pulse voltammetry. *Electrochimica Acta*, **56** (5), 2062-2067.

Full Text: [2011\Ele Act56, 2062.pdf](2011/Ele%20Act56,%202062.pdf)

Abstract: In-situ technique quartz crystal microbalance (QCM), differential pulse voltammetry (DPV) and cyclic voltammetry (CV) were employed to investigate the effect of disodium ethylenediamine tetraacetate (EDTA) on photocatalytic reduction of mercury onto nanocrystalline titania (TiO2). Effects of EDTA on adsorption of Hg(II) and its photocatalytic reduction process at the surface of TiO2 in different pH solutions had been studied in detail. From the in-situ response to the adsorption of Hg(II) onto TiO2, the reaction rate and saturation adsorption amount were estimated about 4.71×10-6 g mol-1 min-1 and 46.36 (mg Hg(II)/gTiO2) via the model of pseudo-second-order kinetics respectively. The photocatalytic reduction of Hg at the surface of TiO2 was influenced by pH and the mole ratio of Hg(II) to EDTA. When the ratio of Hg(II) to EDTA 1:1, it was most favorable for the photocatalytic reduction of mercury. In addition, the effects of HCOOH and EDTA on the reduction of Hg(II) was comparatively investigated and the mechanism on the photocatlytic reduction of mercury was illustrated. Therefore, it could be concluded that QCM. DPV and CV were effective methods for the investigation of photocatalytic reduction of complex heavy metal ions onto the surface of nanocrystalline TiO2. (C) 2010 Published by Elsevier Ltd.

Keywords: Adsorption, Bilirubin Adsorption, Cu(II), Degradation, Differential Pulse Voltammetry (DPV), Disodium Ethylenediamine Tetraacetate (EDTA), Edta, Hydroxyapatite Coatings, Kinetics, Mercury, Metal-Ions, Nanocrystalline Titania (TiO2), Oxidation, pH, Quartz Crystal Microbalance (QCM), Removal, Surface, TiO2 Photocatalysis, Water

? Kobya, M., Gebologlu, U., Ulu, F., Oncel, S. and Demirbas, E. (2011), Removal of arsenic from drinking water by the electrocoagulation using Fe and Al electrodes. *Electrochimica Acta*, **56** (14), 5060-5070.

Full Text: [2011\Ele Act56, 5060.pdf](2011/Ele%20Act56,%205060.pdf)

Abstract: A novel technique of electrocoagulation (EC) was attempted in the present investigation to remove arsenic from drinking waters. Experiments were carried out in a batch electrochemical reactor using Al and Fe electrodes with monopolar parallel electrode connection mode to assess their efficiency. The effects of several operating parameters on arsenic removal such as pH (4-9), current density (2.5-7.5 A m(-2)), initial concentration (75-500 mu g L(-1)) and operating time (0-15 min) were examined. Optimum operating conditions were determined as an operating time of 12.5 min and pH 6.5 for Fe electrode (93.5%) and 15 min and pH 7 for Al electrode (95.7%) at 2.5 A m(-2), respectively. Arsenic removal obtained was highest with Al electrodes. Operating costs at the optimum conditions were calculated as 0.020 (sic) m(-3) for Fe and 0.017 (sic) m(-3) for Al electrodes. EC was able to bring down aqueous phase arsenic concentration to less than 10 mu g L(-1) with Fe and Al electrodes. The adsorption of arsenic over electrochemically produced hydroxides and metal oxide complexes was found to follow pseudo second-order adsorption model. Scanning electron microscopy was also used to analyze surface topography of the solid particles at Fe/Al electrodes during the EC process. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Aluminum Electrode, Area, Arsenic, Chromium, Coagulation, Drinking Water, Electrochemical Technologies, Electrocoagulation, Flow, Iron, Iron Electrode, Model, Pseudo-Second-Order, Remediation, Waste-Water, Wastewaters

# Title: Electroencephalography and Clinical Neurophysiology

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ISSN: 0013-4694

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? Visser, S.L. and Derijke, W. (1998), Brain electrical-activity mapping: A literature-review and clinical-evaluation. *Electroencephalography and Clinical Neurophysiology*, **69** (2), P36-P37.

# Title: Electronic Information and Publications: Looking to the Electronic Future, Let’s not Forget the Archival Past

Full Journal Title: Electronic Information and Publications: Looking to the Electronic Future, Let’s not Forget the Archival Past

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

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Subject Categories:

: Impact Factor

? McPhail, A.S. and Crampton, M. (1999), FISHLIT, a review of NISC South Africa’s aquatic sciences database. *Electronic Information and Publications: Looking to the Electronic Future, Let’s not Forget the Archival Past*, 155-166.

Abstract: FISHLIT, a bibliographic database on fish fisheries and aquaculture produced by NISC South Africa, has been in existence since 1985 and is currently available on CD-ROM, being included on the NISC publications Aquatic Biology, Aquaculture and Fisheries Resources, and Fish and Fisheries Worldwide, and the lnternet. An historical account of the design and development of FISHLIT, including a description of the data structure, database size and growth, is provided. A breakdown of source material, for example scientific articles, reports, popular articles and books, is given, as well as the grey literature indexed, a notable strength of this database. A bibliometric analysis is made of the two anthology CD-ROM titles on which FISHLIT is published in terms of subject coverage and numbers of records. Topic coverage is graphically presented and the application of FISHLIT to areas of aquatic science, such as ichthyology, aquaculture and fisheries management, is discussed. Comparisons are drawn between FISHLIT and other currently available aquatic science databases.

Keywords: Africa, Analysis, Application, Aquaculture, Aquatic Science, Bibliographic Database, Bibliometric, Bibliometric Analysis, CD-ROM, Coverage, Data, Data Structure, Database, Databases, Design, Development, Fish, Fisheries, Fisheries Management, Growth, Literature, Management, Publications, Records, Resources, Review, Science, Sciences, Size, Source, South Africa, South-Africa, Strength, Structure

# Title: Electronic Journal of Biotechnology

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da Costa, A.C.A., Tavares, A.P.M. and de França, F.P. (2001), The release of light metals from a brown seaweed (*Sargassum* sp.) during zinc biosorption in a continuous system. *Electronic Journal of Biotechnology*, **4** (3), 125-129.

Full Text: [E\Ele J Bio4, 125.pdf](E/Ele%20J%20Bio4,%20125.pdf)

Abstract: The biosorption of zinc and calcium was investigated with a biomass of *Sargassum* sp., a brown seaweed, in a continuous system consisting of three serial tubular fixed-bed laboratory reactors. Results indicated that zinc was efficiently recovered by the biomass. After treatment of 9.0 liters of a mixed solution containing 130.0 mg/l zinc and 260.0 mg/l calcium, the first column of the system saturated with zinc, the remaining columns did not saturate with zinc as a result of the pre treatment performed by the first reactor. Calcium was also efficiently biosorbed by the biomass, saturating the system much faster than zinc. X-ray fluorescence spectrum indicated the presence of various elements in the structure of the *Sargassum* sp. biomass, especially alkaline and alkaline-earth elements. Alkaline and alkaline earth elements played a key role in the biosorption of zinc, being responsible for ion-exchange reactions performed during zinc biosorption.

Keywords: Biomass, Heavy Metal, Uptake, Wastewater

Cossich, E.S., Tavares, C.R.G. and Ravagnani, T.M.K. (2002), Biosorption of chromium(III) by *Sargassum* sp. biomass. *Electronic Journal of Biotechnology*, **5** (2), 133-140.

Full Text: [E\Ele J Bio4, 133.pdf](E/Ele%20J%20Bio4,%20133.pdf)

Abstract: Chromium is present in different types of industrial effluents, being responsible for environmental pollution. Traditionally, the chromium removal is made by chemical precipitation. However, this method is not completely feasible to reduce the chromium concentration to levels as low as required by environmental legislation. Biosorption is a process in which solids of natural origin are employed for binding heavy metals. It is a promising alternative method to treat industrial effluents, mainly because of its low cost and high metal binding capacity. In this work the chromium biosorption process by Sargassum sp. seaweed biomass is studied. *Sargassum* sp. seaweed, which is abundant in the Brazilian coast, has been utilized with and without milling. The work considered the determination of chromium-biomass equilibrium data in batch system. These studies were carried out in order to determine some operational parameters of chromium sorption such as the time required for the metal-biosorbent equilibrium, the effects of biomass size, pH and temperature. The results showed that pH has an important effect on chromium biosorption capacity. The biosorbent size did not affect chromium biosorption rate and capacity.

Keywords: Chromium Removal, Heavy Metal, Langmuir Model

Antunes, W.M., Luna, A.S., Henriques, C.A. and da Costa, A.C.A. (2003), An evaluation of copper biosorption by a brown seaweed under optimized conditions. *Electronic Journal of Biotechnology*, **6** (3), 174-184.

Full Text: [E\Ele J Bio6, 174.pdf](E/Ele%20J%20Bio6,%20174.pdf)

Abstract: A basic investigation into the removal of copper ions from aqueous solutions by *Sargassum* sp. was conducted in batch conditions. The influence of different experimental parameters such as initial pH, shaking rate, sorption time, temperature, equilibrium conditions and initial concentrations of copper ions on copper uptake was evaluated. Results indicated that for shaking rates higher than 100 rpm no significant changes in copper accumulation were observed, as well as for pH values between 3.0 and 5.0. No marked effect on the biosorption of copper was detected for temperatures between 298 and 328K. The Langmuir model better represented the sorption process, in comparison to the model of Freundlich. The process followed a second-order kinetics and its calculated activation energy was 5.2 kcal/mol. Due to its outstanding copper uptake capacity (1.48 mmol/g biomass) *Sargassum* sp. proved to be an excellent biomaterial for accumulating and recovering copper from industrial solutions.

Keywords: Biosorption, Copper, Equilibrium, Kinetics, *Sargassum* sp.

Mendonça, E., Martins, A. and Anselmo, A.M. (2004), Biodegradation of natural phenolic compounds as single and mixed substrates by *Fusarium flocciferum*. *Electronic Journal of Biotechnology*, **7** (1), 30-37.

Full Text: [E\Ele J Bio7, 30.pdf](E/Ele%20J%20Bio7,%2030.pdf)

Abstract: The mycelium of *Fusarium flocciferum* was assayed for its ability to degrade aromatic compounds, namely, gallic, protocatechuic, vanillic, syringic, caffeic, and ferulic acids and syringic aldehyde, commonly found in agro-industrial wastes. The biodegradation assays were performed in liquid medium with the phenolic compounds as single substrates and as a synthetic mixture containing the seven aromatic compounds. The results with single substrates indicated that in 24 hrs of incubation the fungus was able to reduce the phenolic concentration from 200 mg/l to below detection limits, except for syringic acid, being the lowest degradation rates found for this acid and its aldehyde. The biodegradation experiments with the mixture of phenolic compounds showed that after 8 hrs the total phenolic concentration was reduce from 350 mg/l to below the detection limits of all the tested compounds. In all the experiments a rise in the pH and an effective detoxification of the phenolic solutions were also observed.

Keywords: Biosorption, Copper, Equilibrium, Kinetics, *Sargassum* sp.

Hussein, H., Farag, S., Kandil, K. and Moawad, H. (2004), Biosorption of heavy metals from waste water using *Pseudomonas* sp. *Electronic Journal of Biotechnology*, **7** (1), 38-46.

Full Text: [E\Ele J Bio7, 38.pdf](E/Ele%20J%20Bio7,%2038.pdf)

Abstract: Biosorption experiments for Cr(VI), Cu(II), Cd(II) and Ni(II) were investigated in this study using nonliving biomass of different *Pseudomonas* species. The applicability of the Langmuir and Freundlich models for the different biosorbent was tested. The coefficient of determination (R2) of both models were mostly greater than 0.9. In case of Ni(II) and Cu(II), their coefficients were found to be close to one. This indicates that both models adequately describe the experimental data of the biosorption of these metals. The maximum adsorption capacity was found to be the highest for Ni followed by Cd(II), Cu(II) and Cr(VI). Whereas the Freundlich constant k in case of Cd(II) was found to be greater than the other metals. Maximum Cr(VI) removal reached around 38% and its removal increased with the increase of Cr(VI) influent. Cu(II) removal was at its maximum value in presence of Cr(VI) as a binary metal, which reached 93% of its influent concentration. Concerning to Cd(II) and Ni(II) similar removal ratios were obtained, since it was ranged between 35 to 88% and their maximum removal were obtained in the case of individual Cd(II) and Ni(II).

Vijayaraghavan, K., Jegan, J.R., Palanivelu, K. and Velan, M. (2004), Copper removal from aqueous solution by marine green alga *Ulva reticulate*. *Electronic Journal of Biotechnology*, **7** (1), 61-71.

Full Text: [E\Ele J Bio7, 61.pdf](E/Ele%20J%20Bio7,%2061.pdf)

Abstract: The batch removal of copper(II) ions from aqueous solution under different experimental conditions using *Ulva reticulata* was investigated in this study. The copper(II) uptake was dependent on initial pH and initial copper concentration, with pH 5.5 being the optimum value. The equilibrium data were fitted using Langmuir and Freundlich isotherm model, with the maximum copper(II) uptake of 74.63 mg/g determined at a pH of 5.5. The Freundlich model regression resulted in high correlation coefficients and the model parameters were largely dependent on initial solution pH. At various initial copper(II) concentrations (250 to 1000 mg/L), sorption equilibrium was attained between 30 and 120 min. The copper(II) uptake by *U. reticulata* was best described by Pseudo-second order rate model and the rate constant, the initial sorption rate and the equilibrium sorption capacity were also reported. The elution efficiency for copper-desorption from *U. reticulata* was determined for 0.1 M HCl, H2SO4, HNO3 and CaCl2 at various Solid-to-Liquid ratios (S/L). The solution CaCl2 (0.1 M) in HCl at pH 3 was chosen to be the most suitable copper-desorbing agent. The biomass was also employed in three sorption-desorption cycles with 0.1 M CaCl2 (in HCl, pH 3) as the elutant.

Keywords: Biosorption, Desorption, Freundlich Model, Kinetics, Langmuir Model

? Ho, Y.S. (2004), Comment on “An evaluation of copper biosorption by a brown seaweed under optimized conditions” by Antunes, W.M., Luna, A.S., Henriques, C.A. and da Costa, A.C.A. *Electronic Journal of Biotechnology*, **7** (2).

Full Text: [E\Ele J Bio-Ho.pdf](E/Ele%20J%20Bio-Ho.pdf) [E\Ele J Bio-Ho1.pdf](E/Ele%20J%20Bio-Ho1.pdf) [E\Ele J Bio-Ho2.pdf](E/Ele%20J%20Bio-Ho2.pdf)

An example of bibliographic reference to an article published in Electronic Journal of Biotechnology, according to ISO International Standard ISO 690-2 norm, would be formulated as follows: Ho, Y.S., Comment on ‘An evaluation of copper biosorption by a brown seaweed under optimized conditions’ by Antunes, W.M., Luna, A.S., Henriques, C.A. and da Costa, A.C.A. *Electronic Journal of Biotechnology* [online]. 01 September 2004, vol. 7, no. 2 [cited 01 September 2004]. Available from: http: //www.ejbiotechnology.info/content/vol7/issue2/letter/1/index.html. ISSN 0717-3458.

? da Costa, A.C.A. (2004), Response letter to Dr Yuh-Shan Ho. *Electronic Journal of Biotechnology*, **7** (2),.

Full Text: [E\Ele J Bio-Costa.pdf](E/Ele%20J%20Bio-Costa.pdf)

An example of bibliographic reference to an article published in Electronic Journal of Biotechnology, according to ISO International Standard ISO 690-2 norm, would be formulated as follows: da Costa, A.C.A., Response letter to Dr Yuh-Shan Ho. *Electronic Journal of Biotechnology* [online]. 01 September 2004, vol. 7, no. 1 [cited 01 September 2004]. Available from: [http: //www.ejbiotechnology.cl/content/vol7/issue2/letter/1/indexb.html](http://www.ejbiotechnology.info/content/vol2/issue3/full/3/index.html). ISSN 0717-3458.

Horsfall, Jr., M. and Spiff, A.I. (2004), Studies on the effect of pH on the sorption of Pb2+ and Cd2+ ions from aqueous solutions by *Caladium bicolor* (Wild Cocoyam) biomass. *Electronic Journal of Biotechnology*, **7** (3), 310-320.

Full Text: [E\Ele J Bio7, 310.pdf](E/Ele%20J%20Bio7,%20310.pdf)

Abstract: Environmental protection requires the use of natural products instead of chemicals to minimize pollution. This investigation studies the use of a non-useful plant material as naturally occurring biosorbents for the removal of cationic pollutants in wastewater. The effect of pH on the sorption of Pb2+ and Cd2+ ion onto *Caladium bicolor* corm biomass was investigated. The experimental results have been analysed in terms of Langmuir, Freundlich and Flory-Huggins isotherms. The data showed that the maximum pH (pHmax) for efficient sorption of Pb2+ was 7.0 and for Cd2+ 5.0. Evaluation using Langmuir equation gave the monolayer sorption capacity as 88.50 mg/g and 65.50 mg/g at the respective pHmax for Pb2+ and Cd2+. Surface characterization of acid and base treated *C. bicolor* biomass indicates a physiosorption as the predominant mechanism for the sorption process. The thermodynamic assessment of the metal ion – *Caladium bicolor* biomass system indicates the feasibility and spontaneous nature of the process.

Keywords: Adsorption, Cocoyam, Heavy Metals Removal, Phytoremediation, Water Treatment, Cassava Waste, Removal, Copper, Lead

? Nomanbhay, S.M. and Palanisamy, K. (2005), Removal of heavy metal from industrial wastewater using chitosan coated oil palm shell charcoal. *Electronic Journal of Biotechnology*, **8** (1), 43-53.

Full Text: [2005\Ele J Bio8, 43.pdf](2005/Ele%20J%20Bio8,%2043.pdf)

Abstract: This research focuses on understanding biosorption process and developing a cost effective technology for treatment of heavy metals-contaminated industrial wastewater. A new composite biosorbent has been prepared by coating chitosan onto acid treated oil palm shell charcoal (AOPSC). Chitosan loading on the AOPSC support is about 21% by weight. The shape of the adsorbent is nearly spherical with particle diameter ranging 100~150 µm. The adsorption capacity of the composite biosorbent was evaluated by measuring the extent of adsorption of chromium metal ions from water under equilibrium conditions at 25ºC. Using Langmuir isotherm model, the equilibrium data yielded the following ultimate capacity values for the coated biosorbent on a per gram basis of chitosan: 154 mg Cr/g. Bioconversion of Cr(VI) to Cr(III) by chitosan was also observed and had been shown previously in other studies using plant tissues and mineral surfaces. After the biosorbent was saturated with the metal ions, the adsorbent was regenerated with 0.1 M sodium hydroxide. Maximum desorption of the metal takes place within 5 bed volumes while complete desorption occurs within 10 bed volumes. Details of preparation of the biosorbent, characterization, and adsorption studies are presented. Dominant sorption mechanisms are ionic interactions and complexation.

? Horsfall, Jr., M. and Spiff, A.I. (2005), Effects of temperature on the sorption of Pb2+ and Cd2+ from aqueous solution by *Caladium bicolor* (Wild Cocoyam) biomass. *Electronic Journal of Biotechnology*, **8** (2), 162-169.

Full Text: [2005\Ele J Bio8, 162.pdf](2005/Ele%20J%20Bio8,%20162.pdf)

Abstract: This report is based on the investigation of the effect of temperature on the removal of Pb2+ and Cd2+ in aqueous effluent using *C. bicolor* biomass in a batch sorption process. The result showed that the most suitable sorption temperature was 40ºC with maximum sorption capacities of 49.02 mg/g and 52.63 mg/g for Pb2+ and Cd2+ respectively. Various thermodynamic parameters, such as ΔGo, ΔHo, ΔSo and Ea have been calculated. The data showed that the sorption process is spontaneous and exothermic in nature and that lower solution temperatures favours metal ion removal by the biomass. The findings of this investigation suggest that physical sorption plays a role in controlling the sorption rate. The sticking probability model was further employed to assess the applicability of the *C. bicolor* biomass as an alternative adsorbent for metal ion contaminants in aqueous system.

? Ahalya, N., Kanamadi, R.D. and Ramachandra, T.V. (2005), Biosorption of chromium(VI) from aqueous solutions by the husk of Bengal gram (*Cicer arientinum*). *Electronic Journal of Biotechnology*, **8** (3), 258-264.

Full Text: [2005\Ele J Bio8, 258.pdf](2005/Ele%20J%20Bio8,%20258.pdf)

Abstract: The potential to remove Cr(VI) from aqueous solutions through biosorption using the husk of Bengal gram (*Cicer arientinum*), was investigated in batch experiments. The results showed removal of 99.9% of chromium in the 10 mgl-1 chromium solution, the biomass required at saturation was 1 g mg-1. Kinetic experiments revealed that the dilute chromium solutions reached equilibrium within 180 min. The biosorptive capacity of the (bgh) was dependent on the pH of the chromium solution, with pH 2 being optimal. The adsorption data fit well with the Langmuir and Freundlich isotherm models. The adsorption capacity calculated from the Langmuir isotherm was 91.64 mg Cr(VI)/g at pH 2. The adsorption capacity increased with increase in agitation speed and an optimum was achieved at 120 rpm. The biosorption of Cr(VI) was studied by Fourier transform infrared spectroscopy (FTIR), which suggested that the presence of Cr(VI) ions in the biomass affects the bands corresponding to hydroxyl and carboxyl groups. Comprehensive characterisation of parameters indicates bgh to be an excellent material for biosorption of Cr(VI) to treat wastewaters containing low concentration of the metal.

? Horsfall, Jr., M. and Spiff, A.I. (2006), Effects of temperature on the sorption of Pb2+ and Cd2+ from aqueous solution by *Caladium bicolor* (Wild Cocoyam) biomass. *Electronic Journal of Biotechnology*, **8** (2), 162-169.

Full Text: [2006\Ele J Bio8, 162.pdf](2006/Ele%20J%20Bio8,%20162.pdf)

Abstract: This report is based on the investigation of the effect of temperature on the removal of Pb2+ and Cd2+ in aqueous effluent using 40°C. bicolor biomass in a batch sorption process. The result showed that the most suitable sorption temperature was 40 C with maximum sorption capacities of 49.02 mg/g and 52.63 mg/g for Pb2+ and Cd2+ respectively. Various thermodynamic parameters, such as. ΔG°, ΔH°, ΔS°and E-a have been calculated. The data showed that the sorption process is spontaneous and exothermic in nature and that lower solution temperatures favours metal ion removal by the biomass. The findings of this investigation suggest that physical sorption plays a role in controlling the sorption rate. The sticking probability model was further employed to assess the applicability of the C. bicolor biomass as an alternative adsorbent for metal ion contaminants in aqueous system.

Keywords: Biosorption, Cocoyam, Heavy Metals Removal, Temperature, Thermodynamics of Sorption, Waste Management, Removal, Copper, Waste, Ions, Lead

? Khani, M.H., Keshtkar, A.R., Meysami, B., Zarea, M.F. and Jalali, R. (2006), Biosorption of uranium from aqueous solutions bynonliving biomass of marinealgae *Cystoseira indica*. *Electronic Journal of Biotechnology*, **9** (2), 100-106.

Full Text: [2006\Ele J Bio9, 100.pdf](2006/Ele%20J%20Bio9,%20100.pdf)

Abstract: Biosorption of heavy metals can be an effective process for the removal and recovery of heavy metal ions from aqueous solutions. In this paper uranium biosorption by protonated, Ca-pretreated and non-pretreated Cystoseira indica algae biomass was investigated in a batch system. The results of the kinetic studies showed that the sorption of uranium on protonated and non-pretreated biomass followed pseudo-second order kinetics. The effect of pH on the equilibrium uranium sorption capacity of Cystoseira indica exhibited that highest uptake occurred at pH 4 at a solution with 350 mg/l uranium concentration. At various initial uranium concentrations from 50 to 1000 mg/l, batch sorption equilibrium at 30°C was reached within 3 hrs and the sorption isotherms were interpreted in terms of the Langmuir and Freundlich models. Equilibrium data fitted very well to Langmuir model for all studied forms of Cystoseira indica algae. The Freundlich isotherm cannot fit as well as the Langmuir model the equilibrium data of protonated and non-pretreated Cystoseira indica algae. The maximum uranium adsorption capacity on the Ca-pretreated, protonated and non-pretreated Cystoseira indica algae predicted by Langmuir isotherm at pH 4 and 30°C was 454.5, 322.58 and 224.67 mg/g respectively.

Keywords: Adsorption, Adsorption Capacity, Algae, Aqueous Solutions, Batch, Batch Sorption, Batch System, Biomass, Biosorption, Capacity, Concentration, Concentrations, Cu, Cystoseira Indica, Effect of pH, Effective, Equilibrium, Equilibrium Data, Freundlich, Freundlich Isotherm, Heavy Metal, Heavy Metal Ions, Heavy Metals, Heavy-Metal, Heavy-Metals, Ions, Isotherm, Isotherms, Kinetic, Kinetic Studies, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Model, Langmuir-Isotherm, Marine Algae, Metal, Metal Ions, Metals, Model, Models, Order, Paper, pH, Process, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Reactors, Recovery, Removal, Single, Solutions, Sorption, Sorption Capacity, Sorption Equilibrium, Sorption Isotherms, Uptake, Uranium, Uranium Adsorption, Uranium, Water

? Horsfall, Jur., M., Ogban, F.E. and Akporhonor, E.E. (2006), Recovery of lead and cadmium ions from metal-loaded biomass of wild cocoyam (Caladium bicolor) using acidic, basic and neutral eluent solutions. *Electronic Journal of Biotechnology*, **9** (2), 152-156.

Full Text: [2006\Ele J Bio9, 152.pdf](2006/Ele%20J%20Bio9,%20152.pdf)

Asbtract: The effects of acidic, basic and neutral reagents on the recovery of Pb2+ and Cd2+ from metal-loaded biomass of wild cocoyam (*C. bicolor*) were investigated by eluting the biomass in five successive cycles using 0.01 M HCl, 0.1 M HCl, 0.01 M NaOH, 0.1 M NaOH and distilled water at different contact times. The data showed that the ease of metal ion recovery from metal -loaded biomass by the eluent solutions is of the order 0.01 M HCl > 0.1 M HCl > 0.01 M NaOH > 0.1 M NaOH > distilled water. Over 94% Pb2+ and 74% Cd2+ of the initially adsorbed metals were recovered by 0.01 M HCl, while < 20% of both metals was recovered by basic reagent. Distilled water recovered less than 9% of both metal ions from the biomass. Macroscopic changes were also observed as the concentration of recovery reagent increased. This study has demonstrated that the selection of a recovery reagent for metal ions on a biomaterial should give consideration to the reusability of the biomass.

? Wankasi, D., Horsfall, Jr., M. and Spiff, A.I. (2006), Sorption kinetics of Pb2+ and Cu2+ ions from aqueous solution by Nipah palm (*Nypa fruticans* Wurmb) shoot biomass. *Electronic Journal of Biotechnology*, **9** (5), 587-592.

Full Text: [2006\Ele J Bio9, 587.pdf](2006/Ele%20J%20Bio9,%20587.pdf)

Abstract: The sorption kinetics of Pb2+ and Cu2+ ions in aqueous solution by unmodified and mercaptoacetic acid modified biomass of Nypa fruticans shoot has been investigated. The equilibrium sorption capacity of Pb2+ and Cu2+ was determined from the Langmuir equation and found to be 15.59 mg/g and 21.85 mg/g for unmodified biomass and 52.86 mg/g and 66.71 mg/g for modified biomass at 30ºC. The time dependent studies showed relatively rapid sorption of 5 - 10 min to reach equilibrium for both metal ions. A batch sorption model, based on the assumption of the pseudo-second order mechanism, was applied to predict the rate constants (g mg-1 min-1), which were found to be 3.59×10-4 (Pb2+) and 1.85×10-4 (Cu2+) and 2.82×10-2 (Pb2+) and 3.67×10-2 (Cu2+) on unmodified and mercaptoacetic acid modified biomass respectively. The activation energy of the sorption of Pb2+ and Cu2+ on Nypah palm reveals an endothermic process.

Keywords: Adsorption, Heavy Metal Binding, Nipah Palm

? Popuri, S.R., Jammala, A., Reddy, K.V.N.S. and Abburi, K. (2007), Biosorption of hexavalent chromium using tamarind (*Tamarindus indica*) fruit shell: A comparative study. *Electronic Journal of Biotechnology*, **10** (3), 358-367.

Full Text: [2007\Ele J Bio10, 358.pdf](2007/Ele%20J%20Bio10,%20358.pdf)

Abstract: The adsorption of chromium(VI) ions from aqueous solutions has been investigated on crude tamarind fruit shell, HCl treated and Oxalic acid treated shells at room temperatures. The biosorbents are characterized by FTIR, EDXRF and porosimetry. The biosorption experiments are conducted through batch system. The influence of different experimental parameters such as pH, effect of initial metal ion concentration and effect of dosage of adsorbent on biosorption are evaluated. The adsorption followed first order kinetics. The data are fitted well to Langmuir and Freundlich isotherm models. A comparison is drawn on the extent of biosorption between untreated and treated forms of the tamarind shells. Due to their outstanding adsorption capacities, tamarind shells are excellent sorbents for the removal of chromium ions.

Keywords: Biosorption, Chromium(VI), Pre-Treatment, Tamarindus Indica Fruit Shell, Aqueous-Solution, Activated Carbon, Citric-Acid, Metal-Ions, Adsorption, Removal, Chitosan, Sorption, Adsorbents, Biomass

? Vieira, D.M., da Costa, A.C.C., Henriques, C.A., Cardoso, V.L. and de Franca, F.P. (2007), Biosorption of lead by the brown seaweed *Sargassum filipendula*: Batch and continuous pilot studies. *Electronic Journal of Biotechnology*, **10** (3), 368-375.

Full Text: [2007\Ele J Bio10, 368.pdf](2007/Ele%20J%20Bio10,%20368.pdf)

Abstract: The biosorption of lead by the brown alga Sargassum filipendula was studied. pH 4.0 was the optimum value for the biosorption of lead. Isotherms indicated that for solutions containing 0.03±0.001 up to 3.27±0.04 mmol/L of lead, 2.0g/L was the optimum biomass concentration. The Langmuir model was fitted to represent the experimental data, and the kinetics of biosorption presented equilibrium in 30 min. The continuous system operated for 56 hrs presenting a 100% binding of ionic lead, which corresponds to an accumulation of 168 g lead, equivalent to a load of 1.7 mmol ionic lead/g Sargassum filipendula. The results that were obtained in a continuous system showed a gradual saturation of the biomass in the reactors.

Keywords: Biosorption, Biosorption Equilibrium, Continuous System, Lead, Sargassum Filipendula, Marine-Algae, Aqueous-Solutions, Heavy-Metals, sp Biomass, Removal, Copper, Cadmium, Equilibrium, Desorption, Mechanisms

? Igwe, J.C. and Abia, A.A. (2007), Equilibrium sorption isotherm studies of Cd(II), Pb(II) and Zn(II) ions detoxification from waste water using unmodified and EDTA-modified maize husk. *Electronic Journal of Biotechnology*, **10** (4), 536-548.

Full Text: [2007\Ele J Bio10, 536.pdf](2007/Ele%20J%20Bio10,%20536.pdf)

Abstract: The mobilization of heavy metals in the environment due to industrial activities is of serious concern due to the toxicity of these metals in humans and other forms of life. The equilibrium adsorption isotherms of Cd(II), Pb(II) and Zn(II) ions, detoxification from waste water using unmodified and EDTA-modified maize husk have been studied. Maize husk was found to be an excellent adsorbent for the removal of these metal ions. The amount of these metal ions adsorbed increased as the initial concentration increased. Also, EDTA-modification enhanced the adsorption capacity of maize husk due to the chelating ability of ethylenediamine tetra acetic acid (EDTA). Among the three adsorption isotherms tested, Dubinin-Radushkevich isotherm gave the best fit with R-2 value ranging from 0.7646 to 0.9988 and an average value of 0.9321. This is followed by Freundlich and then Langmiur isotherms. The sorption process was found to be mostly a physiosorption process as seen from the apparent energy of adsorption which ranged from 1.03 KJ/ mol to 12.91 KJ/ mol. Therefore, this study demonstrates that maize husk which is an environmental pollutant could be used to adsorb heavy metals and achieve environmental cleanliness.

Keywords: Adsorption Isotherm, EDTA, Heavy Metals, Maize Husk, Waste Water, Itai-Itai Disease, Activated Carbon, Aqueous-Solution, Phenolic-Compounds, Heavy-Metals, Biosorption, Adsorption, Removal, Biomass, Cadmium

? Qaiser, S., Saleemi, A.R. and Umar, M. (2009), Biosorption of lead(II) and chromium(VI) on groundnut hull: Equilibrium, kinetics and thermodynamics study. *Electronic Journal of Biotechnology*, **12** (4), Article Number: 6.

Full Text: [2009\Ele J Bio12, 6.pdf](2009/Ele%20J%20Bio12,%206.pdf)

Abstract: The biosorption of lead(II) and chromium(VI) on groundnut hull was investigated. Batch biosorption experiments were conducted to find the equilibrium time and biosorption capacity. Effect of parameters like pH, temperature and initial metal concentration was studied. The maximum biosorption capacity of lead(II) and chromium(VI) was found to be 31.54±0.63 and 30.20.74 mg g-1, respectively. The optimum pH for lead(II) and chromium(VI) removal was 5±0.1 and 2±0.1, respectively. The temperature change, in the range of 20-45ºC affected the biosorption capacity. The maximum removal of lead(II) was achieved at 20±2ºC, where as maximum uptake of chromium(VI) was observed at 40±2ºC. The biosorption data was fitted to the Langmuir and the Freundlich isotherm models. The Langmuir model showed better representation of data, with correlation coefficient greater than 0.98. The kinetics of biosorption followed the pseudo second order kinetics model. The thermodynamics parameters were evaluated from the experimental data.

Keywords: Activated Carbon, Adsorption, Aqueous-Solution, Aspergillus-Niger, Bagasse Fly-Ash, Biosorption, Capacity, Chromium(VI), Chromium(VI) Removal, Concentration, Correlation, Correlation Coefficient, Data, Equilibrium, Experimental, Experiments, Freundlich, Freundlich Isotherm, Groundnut Hull, Heavy-Metals, Isotherm, Kinetics, Kinetics and Thermodynamics, Kinetics Model, Langmuir, Langmuir Model, Lead(II), Low-Cost Adsorbents, Metal, Model, Models, pH, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Range, Removal, Representation, Second Order, Second Order Kinetics, Second-Order, Sugar-Industry Waste, Temperature, Thermodynamics, Time, Uptake, VI, Water

? Pan, X.L. and Zhang, D.Y. (2009), Removal of malachite green from water by *Firmiana simplex* wood fiber. *Electronic Journal of Biotechnology*, **12** (4), Article Number: 4.

Full Text: [2009\Ele J Bio12, 4.pdf](2009/Ele%20J%20Bio12,%204.pdf)

Abstract: This study shows that wood fiber of Phoenix tree (*Firmiana simplex*) is an effective adsorbent for malachite green (MG). MG sorption behavior onto the wood adsorbent was investigated in this study. Basic condition was favorable for MG adsorption to the adsorbent. The pseudo second order equation well described MG adsorption onto the wood adsorbent. The Freundlich Isotherm could describe the sorption data. The positive value of ΔHº showed that adsorption of malachite green onto the wood adsorbent was endothermic. The negative values of ΔGº at various temperatures indicate the spontaneous nature of the adsorption process.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Aqueous-Solution, Behavior, Biosorption, Data, Dye, Endothermic, Equilibrium, Freundlich, Isotherm, Kinetics, Malachite Green, Mg, Nonlinear Methods, Pseudo Second Order, Pseudo-Second-Order, Removal, Sawdust, Second Order, Second-Order, Sorption, Sorption Isotherm, Thermodynamics, Value, Waste-Water, Water, Wood, Wood Fiber

? Alpat, S., Alpat, S.K., Çadirci, B.H., Özbayrak, Ö. and Yasa, İ. (2010), Effects of biosorption parameter: Kinetics, isotherm and thermodynamics for Ni(II) biosorption from aqueous solution by *Circinella* sp. *Electronic Journal of Biotechnology*, **13** (5), Article Number: 20.

Full Text: [2010\Ele J Bio13, 20.pdf](2010/Ele%20J%20Bio13,%2020.pdf)

Abstract: Circinella sp. was employed as a biosorbent for removal of Ni(II) from aqueous solution. The biosorption kinetics and isotherms were investigated. The effect of several parameters, such as biosorbent dosage, contact time, initial concentration, pH and temperature, on biosorption process was evaluated. The kinetic studies indicated that the biosorption followed pseudo-second order kinetic model. Biosorption behaviour of Ni(II) on Circinella sp. was expressed by both Langmuir and Freundlich isotherms. The equilibrium data fit better to the Langmuir model compared to the Freundlich model in concentration range studied (1.0-3.0 mM). The thermodynamic parameters (ΔG(0), ΔH-0 and ΔS-0) were also determined, and it was found that the Ni(II) biosorption by Circinella sp. was spontaneous and endothermic in nature.

Keywords: *Aspergillus-niger*, Bioaccumulation, Biomass, Biosorption, Cadmium(II), Cells, Circinella sp., Copper(II), Equilibrium, Freundlich, Fungi, Kinetic, Kinetic Model, Kinetics, Langmuir, Nickel, Nickel(II) Ions, pH, Removal, Thermodynamic, Thermodynamics

? Erden, E., Kaymaz, Y. and Pazarlioglu, N.K. (2011), Biosorption kinetics of a direct azo dye Sirius Blue K-CFN by Trametes versicolor. *Electronic Journal of Biotechnology*, **14** (2), Article Number: 8.

Full Text: 2011\Ele J Bio14, 8.pdf

Abstract: In this study, lyophilized Trametes versicolor biomass is used as a sorbent for biosorption of a textile dye, Sirius Blue K-CFN, from an aqueous solution. The batch sorption was studied with respect to dye concentration, adsorbent dose and equilibrium time. The effect of pH and temperature on dye uptake was also investigated and kinetic parameters were determined. Optimal initial pH (3.0), equilibrium time (2 hrs), initial dye concentration (100 mg l-1) and biomass concentration (1.2 mg l-1) were determined at 26ºC. The maximum biosorption capacity (*q*max) of Sirius Blue K-CFN dye on lyophilized T. versicolor biomass is 62.62 mg/g. The kinetic and isotherm studies indicated that the biosorption process obeys to a pseudo-second order model and Langmuir isotherm model. In addition, the biosorption capacities of fungal biomass compared to other well known adsorbents such as activated carbon and Amberlite, fungal biomass biosorptions capacities were found to be more efficient.

Keywords: Activated Carbon, Adsorbent, Adsorption, Amberlite, Aqueous Solution, Batch, Biosorbent, Biosorption, Biosorption Kinetics, Direct Dye, Dye, Equilibrium, Fungal Biomass, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, pH, Reactive Dyes, Removal, Sirius Blue K-CFN, Sorbent, Sorption, Systems, Temperature, Textile Dyes, Trametes Versicolor, Uptake

# Title: Electronic Journal of Environment, Agriculture and Food Chemistry

Full Journal Title: Electronic Journal of Environment, Agriculture and Food Chemistry

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1579-4377

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Aslam, M.M., Hassan, I., Malik, M. and Matin, A. (2004), Removal of copper from industrial effluent by adsorption with economical viable material. *Electronic Journal of Environment, Agriculture and Food Chemistry*, **3** (2), 658-664.

Full Text: [2004\Ele J Env Agr Foo Che3, 658.pdf](2004/Ele%20J%20Env%20Agr%20Foo%20Che3,%20658.pdf)

Abstract: In recent times pollution of the environment by heavy metals, which are known to be toxic and nonbiodegradable has become a serious issue. Attention has been directed towards development of alternative treatment methodologies. The removal of heavy metals from electroplating wastewater with economically feasible materials was investigated. Solutions of varying concentrations of Cu (25-100ppm) were prepared and passed through sand column. Leachate samples were analyzed for concentration of these elements by atomic absorption spectrophotometer. This method of heavy metals removal proved highly effective as removal efficiency increased with increasing pH while it decreased with increasing metals concentration. The removal efficiency was quite high for Copper ranging from 97- 70%. Since sand is cheap and easily available, so it can be concluded that the proposed method, which is efficient and cost effective, can successfully be used for metal removal from plating industry wastewater.

# Title: Electronic Markets

Full Journal Title: Electronic Markets

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

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Full Text: [2011\Ele Mar21, 19.pdf](2011/Ele%20Mar21,%2019.pdf)

Abstract: This article examines co-authorship networks of researchers publishing in Electronic Markets-The International Journal of Networked Business (EM). The authors visualize the co-authorship network and provide descriptive statistics regarding the degree to which researchers are embedded in the co-authorship network. They develop and test seven hypotheses associating the researchers’ embeddedness in the co-authorship network with the number of the researchers’ citations. Results indicate that author who publish co-authored articles in EM have their EM articles (whether co-authored or not) cited more frequently than those who publish EM articles only in their own names, and that the more they co-author the more they are cited because they are located in the center of a co-authorship network.

Keywords: Adoption, Article Impact, Author, Authors, Bibliometrics, Bibliometrics, Centrality, Centrality, Citation Analysis, Citations, Co-Author, Co-Authorship, Co-Authorship Networks, Coauthorship, E-Collaboration, Evolution, Information-Systems, International, Journal, Network, Patterns, Perspective, Publishing, Research, Researchers, Scientometrics, Social Network, Social Networks, Statistics, Structural Holes

# Title: Electronic Library

Full Journal Title: [Electronic Library](http://www.emeraldinsight.com/Insight/viewContainer.do?containerType=JOURNAL&containerId=11331)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0264-0473

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Cawkell, A.E. (1989), Automatic indexing in the Science and Social Science Citation Index CD-ROM. *Electronic Library*, **7** (6), 345-350.

Full Text: [1989\Ele Lib7, 345.pdf](1989/Ele%20Lib7,%20345.pdf)

Keywords: Citation, Social Science Citation Index

? Korfiatis, N., Poulos, M. and Bokos, G. (2007), Social metadata for the impact factor. *Electronic Library*, **25** (2), 166-175.

Full Text: [2007\Ele Lib25, 166.pdf](2007/Ele%20Lib25,%20166.pdf)

Abstract: Purpose - The purpose of this research is to address the need for a definition of metadata descriptors for use in enhancing the accuracy of bibliometric instruments of scholarly evaluation, such as the impact factor. Design/methodology/approach - A semantic vocabulary - COAP - is constructed, deployed on top of the Resource Description Framework (RDF), by extending the Friend-of-a-Friend (FOAF) schema. Findings - An extension of the FOAF vocabulary is considered as the ability to describe a publication record such as this paper in terms of scholar contributions and participations. In order to achieve that, the FOAF vocabulary is extended. Practical implications - The application of this semantic vocabulary could be used as a way of enhancing the accuracy of source data for bibliometric evaluation instruments. Originality/value - The paper discusses how metadata descriptors can contribute to the improvement of already established scholar evaluation instruments such as the impact factor. It will be of use in the development of digital libraries.

Keywords: Accuracy, Bibliometric, Bibliometric Evaluation, Development, Digital Libraries, Evaluation, Impact, Impact Factor, Journals, Libraries, Networks, Order, Paper, Publication, Research, Semantics, Social Networks, Source

? Singh, G., Mittal, R. and Ahmad, M. (2007), A bibliometric study of literature on digital libraries. *Electronic Library*, **25** (3), 342-348.

Full Text: [2007\Ele Lib25, 342.pdf](2007/Ele%20Lib25,%20342.pdf)

Abstract: Purpose - The study has been under-taken with the purpose of finding out the growth and characteristics of digital library literature. Design/methodology/approach - Over 1,000 articles for the period 1998-2004 were collected from LISA Plus and were analyzed to study authorship patterns, authors’ productivity and prominent contributors, language-wise and year-wise distribution of articles, country-wise distribution of journals, core journals in the subject area, and indexing term frequency. Findings - Some of the important findings are that most articles (61 percent) are single-authored; author productivity is not in agreement with Lotka’s Law, except in one case where number of articles is three; the maximum number of articles were published in 2003 with English being the most productive language; maximum articles were published in the journal D-fib Magazine; distribution of articles nearly follows Bradford’s Law; and USA ranked first for maximum number of journals. Originality/value - The paper is relevant to those interested in bibliometrics and provides a comprehensive over-view of authorship in the library and information science community.

Keywords: Authorship, Bibliographies, Bibliometric Study, Bibliometrics, Data Analysis, Digital Libraries, Growth, Information Science, Literature, Science

? Tsay, M.Y. (2008), Subject change between citing and cited literature on digital libraries. *Electronic Library*, **26** (5), 702-715.

Full Text: [2008\Ele Lib26, 702.pdf](2008/Ele%20Lib26,%20702.pdf)

Abstract: Purpose - The purpose of this paper is to analyze and compare the subject change for both citing and cited literature on digital libraries based on bibliometric techniques. Design/methodology/approach - Library and Information Science Abstracts (LISA) was used to retrieve data of journal articles in digital libraries from 1960 to 2002. By employing the thesaurus search function, three descriptors for subject search, namely electronic library concept, digital libraries and virtual library concept, as suggested by LISA, were used to retrieve all relevant literature on digital libraries. Findings - Most of the citing core journals on digital libraries are devoted to the subject of the application of computer and information technology to library implication, while the cited literature on digital libraries distributes mainly into four types of journals, namely, digital library orientation, general library and information science, new development in librarianship, and library technology. Digital libraries, electronic media and world wide web (WWW) are the three subject terms in common most for both citing and cited core journal literature. They also constitute the core subject for digital library literature. The change of highly used subject terms, such as WWW, internet, library technology, network, university or academic library, from cited to citing literature suggests that these subjects are becoming the main stream of researches in digital libraries. Research limitations/implications - Most subject terms of this study for both citing and cited literature in digital libraries could be categorized into the technical issues. However, other related issues dealing with copyright, charging and authenticity; social issues; quality of preservation and availability; use and user study; economic issues; education and promotion have not been popular research areas yet by 2002. Further studies are needed. Originality/value - The present work is unique in its study of the subject and the results obtained provide significant insights into the evolution of digital libraries by identifying the core journals and examining their characteristics, as well as subject changes between citing and cited literature on digital libraries.

Keywords: Academic, Application, Authenticity, Availability, Bibliometric, Bibliometric Techniques, Change, Changes, Characteristics, Computer, Data, Development, Digital Libraries, Economic, Education, Evolution, Function, General, Information, Information Science, Information Searches, Information Technology, Internet, Journal, Journal Articles, Journals, Librarianship, Library and Information Science, Literature, Media, Network, Orientation, Preservation, Promotion, Purpose, Quality, Quality of, Research, Science, Search, Serials, Social, Social Issues, Special Topic Issue, Stream, Techniques, Technology, University, Web, Work, World, WWW

? Herther, N.K. (2009), Research evaluation and citation analysis: Key issues and implications. *Electronic Library*, **27** (3), 361-375.

Full Text: [2009\Ele Lib27, 361.pdf](2009/Ele%20Lib27,%20361.pdf)

Abstract: Purpose - Citation and ranking information are becoming key aspects of knowledge management in academic and research institutions. By examining changing user needs and products, this paper aims to encourage information professionals to better understand and manage these resources and better respond to user needs. Design/methodology/approach - Literature reviews, work with faculty clients and initial product testing are used to present coherent information on the current climate and practice of competitive analysis of researchers and their institutions. Findings - As more sources for citation information have become available - even many scholarly databases today offering cited reference data - the need to identify, access and manage these resources is becoming acute. Information professionals need to become more proactive in their strategies to support these applications and users. Originality/value - This article builds on previous analyses of the roles and nature of citation analysis in research institutions and examines potential new roles and contributions that information professionals can take on to better serve their users.

Keywords: Bibliometrics, Citation, Citation Analysis, Collaboration, Counts, Evaluation, Higher Education, Impact Factor, Information Management, Knowledge, Literatures, Management, Publications, Research, Scholarly Communication, Science, Scientific Productivity, Statistics, Web

? Nwagwu, W. and Egbon, O. (2011), Bibliometric analysis of Nigeria’s social science and arts and humanities publications in Thomson Scientific databases. *Electronic Library*, **29** (4), 438-456.

Full Text: [2011\Ele Lib29, 438.pdf](2011/Ele%20Lib29,%20438.pdf)

Abstract: Purpose - This paper seeks to analyse publications on Nigeria indexed in Arts and Humanities Citation Index (AHCI) and Social Science Citation Index (SSCI) of Thomson Scientific databases respectively to understand the international perspective of aspects of research publication dynamics in both fields. Design, methodology, approach - Data covering the period 2002-2007 were collected from the SSCI and AHCI of the Web of Science, an online service of Thomson Scientific in June 2008. Findings - SSCI and AHCI indexed a total of 716 publications on Nigeria, 634 and 82 respectively. Paper production in each of these fields rose during 2002 to 2004 and 2005 respectively, and then started dropping. The publications received a total of 1,371 citations; the 82 AHCI documents received only six citations, while the 634 SSCI publications received 1,366 citations, equivalent to means of 0.06 and 2.15 citations per AHCI and SSCI document respectively. Only 6.1 per cent of the AHCI documents were cited compared with 46.7 per cent of SSCI publications; but citation of social science papers was consistently on the increase, while citation of arts and humanities publications, flattened in 200 humanities, was consistently on the increase. In both fields, article type of papers written in English dominated. Research limitations, implications - This research covers only a period of six years; a fuller picture would be obtained with a longer period. Practical implications - Publications in sources listed in international databases could illustrate the extent to which Nigerian scholars have addressed issues of global relevance. Originality, value - The paper uncovers the international status and perspective of Nigerian publications in social science and arts and humanities disciplines.

Keywords: Analysis, Arts, Arts and Humanities Citation Index, Bibliographies, Bibliometric, Bibliometric Analysis, Citation, Citation Analysis, Citations, Databases, English, Humanities, International Perspective, Nigeria, Papers, Publication, Publications, Research, Science, Science Citation Index, Social, Social Science, Social Science Citation Index, SSCI, Thomson Scientific, Web of Science

? Yuan, S.B. and Hua, W.N. (2011), Scholarly impact measurements of LIS open access journals: Based on citations and links. *Electronic Library*, **29** (5), 682-697.

Full Text: [2011\Ele Lib29, 682.pdf](2011/Ele%20Lib29,%20682.pdf)

Abstract: Purpose - The main purpose of this paper is to measure the scholarly impact of LIS (Library and Information Science) open access journals (OA journals), most of which are not indexed by the Web of Science (WoS). In addition, the paper seeks to discuss measurement methods beyond citation analysis. Design/methodology/approach - The study selected 97 LIS OA journals as a sample and measured their scholarly impact on the basis of citations and links. The citation counts in WoS, coverage in LISA, Web links, WIFs and Page Rank of the journals are retrieved and calculated, and correlations between citation counts, links, pages, WIFs, and Page Rank are also analyzed. Findings - The results indicate that LIS OA journals have become a significant component of the scholarly communication system. The Journal of the Medical Library Association enjoys the highest citation counts in WoS. This journal, together with D-Lib Magazine, Information Research, Ariadne, Cybermetrics, and First Monday are the six most important LIS OA journals. With regard to coverage in LISA, Bulletin des Bibliotheques de France (2151) performs best. As a whole, the Page Rank is relatively high, mostly at 6, 7, or 8. The study finds that correlation between citation-based measurements and link-based measurements tends to be significant. Originality/value - This paper uses the web as a global resource to measure the impact of LIS OA journals by analyzing citation, coverage, web links and Page Rank. The focus of this study is the value of the web as a source of impact indices, rather different from the traditional research methods. It contributes to the scholarly impact measurements of OA journals.

Keywords: Analysis, Articles, Citation, Citation Analysis, Citation Counts, Citations, Communication, Coverage, France, Greater Research Impact, Impact, Indexes, Information Science, Journal, Journals, Library and Information Networks, Library and Information Science, LIS, Measurement, Open Access, Publications, Research, Scholarly Communication, Scholarly Impact Measurement, Science, Sites, Traditional, Web Impact, Web Link Analysis, Web of Science, WOS

# Title: Electronics and Communications in Japan

Full Journal Title: Electronics and Communications in Japan

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

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Journal Country/Territory:

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Subject Categories:

: Impact Factor

? Yamamoto, M., Mase, H., Yajima, H. and Kinukawa, H. (2010), Paper filtering method using features of coauthor research group, subject category, and terminology. *Electronics and Communications in Japan*, **93** (9), 1-11.

Full Text: [2010\Ele Com Jap93, 1.pdf](2010/Ele%20Com%20Jap93,%201.pdf)

Abstract: A paper filtering system that supports the effective collection of related technical papers is becoming important as technological progress accelerates. Two requirements for the paper filtering system are (1) reduction of the user workload in specifying the filtering conditions and (2) sufficient filtering accuracy. We propose a paper filtering method that meets both requirements simultaneously by focusing on the features of the coauthor research group, subject category, and terminology. The result of evaluation using 3600 domestic learned-society papers shows that the proposed method improved the mean average precision from 0.39 to 0.50, that is, by 0.11, compared with the conventional pseudo-relevance feedback method, thus improving its suitability for practical use. (c) 2010 Wiley Periodicals, Inc. Electron Comm Jpn, 93(9): 1-11, 2010; Published online in Wiley Online Library (wileyonlinelibrary.com). DOI 10.1002/ecj.10264.

Keywords: Accuracy, Author, Document Filtering, Evaluation, Feedback, Interest, Papers, Pseudo-Relevance Feedback, Research, Subject Category, Technical Paper

# Title: E-Journal of Chemistry

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? Vasu, A.E. (2008), Adsorption of Ni(II), Cu(II) and Fe(III) from aqueous solutions using activated carbon. *E-Journal of Chemistry*, **5** (1), 1-9.

Full Text: [2008\E-J Che5, 1.pdf](2008/E-J%20Che5,%201.pdf)

Abstract: An activated carbon was tested for its ability to remove transition metal ions from aqueous solutions. Physical, chemical and liquid-phase adsorption characterizations of the carbon were done following standard procedures. Studies on the removal of Ni(II), Cu(II) and Fe(III) ions were attempted by varying adsorbate dose, pH of the metal ion solution and time in batch mode. The equilibrium adsorption data were fitted with Freundlich, Langmuir and Redlich-Peterson isotherms and the isotherm constants were evaluated. Time variation studies indicate that adsorptions follow pseudo-second order kinetics. pH was found to have a significant role to play in the adsorption. The processes were endothermic and the thermodynamic parameters were evaluated. Desorption studies indicate that ion-exchange mechanism is operating.

Keywords: Activated Carbon, Adsorption, Aqueous Solutions, Batch, Batch Mode, Carbon, Characterizations, Chemical, Cu(II), Data, Desorption, Endothermic, Equilibrium, Fe(III), Freundlich, Ion Exchange, Ion-Exchange, Ionexchange, Ions, Isotherm, Isotherms, Kinetics, Langmuir, Liquid-Phase Adsorption, Mechanism, Metal, Metal Ions, Metal Ions Removal, Mode, Ni(II), pH, Procedures, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Redlich-Peterson, Removal, Role, Solution, Solutions, Sorption, Standard, Thermodynamic, Thermodynamic Parameters

? El-Ashgar, N.M. (2008), Column extraction and separation of some metal ions by diethylenetriamine polysiloxane immobilized ligand system. *E-Journal of Chemistry*, **5** (1), 107-113.

Full Text: [2008\E-J Che5, 107.pdf](2008/E-J%20Che5,%20107.pdf)

Abstract: An extraction chromatographic solid porous polysiloxane functionalized by chelating diethylenetriamine ligand of the general formula P-(CH(2))(3)-NH(CH(2))(2)NH(CH(2))(2)NH(2), (Where P represents [Si-O](n) siloxane network) has been evaluated for the separation of Co(II), Ni(II) and Cu(II) from aqueous solutions. The chromatographic parameters of the separation method have been optimized. The ligand system retained Co(II), Cu(II) and Zn(II) effectively when used as a metal ion extractant by controlling the pH value. The ligand system also shows a good separation of a mixture of metal ions Co(II), Ni(II) and Cu(II) when used as chromatographic stationary phase. The optimum separation pH values were 4.5, 4 for Co(II) and Ni(II) respectively, while a solution of 0.1 M HNO(3) was used to elute Cu(II). Metal ions were also preconcentrated at pH 5.5. The chemisorbed metal ions were regenerated from the solid extractant using 0.5 M HCl.

Keywords: 8-Hydroxyquinoline, Adsorption, Amine, Aqueous Solutions, Chelating Ligands, Co(II), Column, Complexes, Cu(II), Diethylenetriamine, Extraction, HCl, Immobilized, Immobilized-Polysiloxane Ligand Systems, Insoluble Ligands, Ion Chromatography, Ions, Metal, Metal Ion, Metal Ions, Network, Ni(II), NMR Structural-Characterization, pH, pH Value, Phosphine, Polysiloxanes, Pre-Concentration, Preconcentration, Separation, Separation of Metal Ions, Silica-Gel, Zn(II)

? Arivoli, S. and Thenkuzhali, M. (2008), Kinetic, mechanistic, thermodynamic and equilibrium studies on the adsorption of Rhodamine B by acid activated low cost carbon. *E-Journal of Chemistry*, **5** (2), 187-200.

Full Text: 2008\E-J Che5, 187.pdf

Abstract: A carbonaceous adsorbent prepared from an indigenous waste by acid treatment was tested for its efficiency in removing Rhodamine B (RDB). The parameters studied include agitation time, initial dye concentration, carbon dose, pH and temperature. The adsorption followed first order reaction equation and the rate is mainly controlled by intra-particle diffusion. Freundlich and Langmuir isotherm models were applied to the equilibrium data. The adsorption capacity (Q(m)) obtained from the Langmuir isotherm plots were 51.546, 47.236, 44.072 and 41.841 mg/g respectively at an initial pH of 7.0 at 30, 40, 50 and 60 degrees C. The temperature variation study showed that the Rhodamine B adsorption is endothermic and spontaneous with increased randomness at the solid solution interface. Significant effect on adsorption was observed on varying the pH of the Rhodamine B solutions. Almost 90% removal of Rhodamine B was observed at 60 degrees C. The Langmuir and Freundlich isotherms obtained, positive Delta H degrees value, pH dependent results and desorption of dye in mineral acid suggest that the adsorption of Rhodamine B on PSC involves physisorption mechanism.

Keywords: Acid, Acid Treatment, Activated Carbon (Psc), Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Capacity, Carbon, Desorption, Diffusion, Dye, Endothermic, Equilibrium, First Order, Freundlich, Freundlich Isotherms, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherm, Isotherm Models, Isotherms, Kinetic, Langmuir, Langmuir and Freundlich Isotherms, Langmuir Isotherm, Mechanism, pH, pH-Dependent, Removal, Rhodamine B, Rhodamine B (RDB), Significant, Spontaneous, Temperature, Thermodynamic, Treatment

? Vasu, A.E. (2008), Removal of phenol and o-cresol by adsorption onto activated carbon. *E-Journal of Chemistry*, **5** (2), 224-232.

Full Text: 2008\E-J Che5, 224.pdf

Abstract: A commercial activated carbon was utilized for the adsorptive removal of phenol and o-cresol from dilute aqueous solutions. Batch mode adsorption studies were performed by varying parameters such as concentration of phenol solution, time, pH and temperature. The well known Freundlich, Langmuir and Redlich-Peterson isotherm equations were applied for the equilibrium adsorption data and the various isotherm parameters were evaluated. The Langmuir monolayer adsorption capacities were found to be 0.7877 and 0.5936 mmole/g, respectively, for phenol and o-cresol. Kinetic studies performed indicate that the sorption processes can be better represented by the pseudo-second order kinetics. The processes were found to be endothermic and the thermodynamic parameters were evaluated. Desorption studies performed indicate that the sorbed phenol molecules can be desorbed with dil. HCl.

Keywords: Activated Carbon, Adsorption, Adsorption Kinetics, Aqueous Solutions, Batch, Batch Mode, Carbon, Desorption, Endothermic, Equilibrium, Freundlich, Hcl, Isotherm, Isotherm Parameters, Kinetic, Kinetic Studies, Kinetics, Langmuir, O-Cresol, pH, Phenol, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Redlich-Peterson, Removal, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters

? Maheswari, P., Venilamani, N., Madhavakrishnan, S., Shabudeen, P.S.S., Venckatesh, R. and Pattabhi, S. (2008), Utilization of sago waste as an adsorbent for the removal of Cu(II) ion from aqueous solution. *E-Journal of Chemistry*, **5** (2), 233-242.

Full Text: 2008\E-J Che5, 233.pdf

Abstract: The preparation of activated carbon (AC) from sago industry waste is a promising way to produce a useful adsorbent for Cu(II) removal, as well as dispose of sago industry waste. The AC was prepared using sago industry waste with H(2)SO(4) and (NH(4))(2)S(2)O(8) and physico-chemical properties of AC were investigated. The specific surface area of the activated carbon was determined and its properties studied by scanning electron microscopy (SEM). Adsorptive removal of Cu( II) from aqueous solution onto AC prepared from sago industry waste has been studied under varying conditions of agitation time, metal ion concentration, adsorbent dose and pH to assess the kinetic and equilibrium parameters. Adsorption equilibrium was obtained in 60min for 20 to 50mg/L of Cu( II) concentrations. The Langmuir and Freundlich equilibrium isotherm models were found to provide an excellent fitting of the adsorption data. In Freundlich equilibrium isotherm, the R(L) values obtained were in the range of 0 to 1 (0.043 to 0.31) for Cu(II) concentration of 10 to 100mg/L, which indicates favorable adsorption of Cu(II) onto Sago waste carbon. The adsorption capacity of Cu(II) (Qo) obtained from the Langmuir equilibrium isotherm model was found to be 32.467 mg/g at pH 4 +/- 0.2 for the particle size range of 125-250 mu. The percent removal increased with an increase in pH from 2 to 4. This adsorbent was found to be effective and economically attractive.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Aqueous Solution, Capacity, Carbon, Copper Removal, Cu(II), Equilibrium, Equilibrium Isotherm, Freundlich, Industry, Isotherm, Isotherm Models, Kinetic, Langmuir, Metal, Metal Ion, Metal Ion Concentration, Microscopy, Model, Ph, Preparation, Removal, Sago Carbon, SEM, Utilization, Waste

? Subbaiah, M.V., Kalyani, S., Reddy, G.S., Boddu, V.M. and Krishnaiah, A. (2008), Biosorption of Cr(VI) from aqueous solutions using trametes versicolor polyporus fungi. *E-Journal of Chemistry*, **5** (3), 499-510.

Full Text: [2008\E-J Che5, 499.pdf](2008/E-J%20Che5,%20499.pdf)

Abstract: Removal of chromium(VI) from aqueous solution was studied using abundantly available trametes versicolor polyponts fungi as biosorbing medium under equilibrium and column flow conditions. Various sorption parameters such as contact time, effect of pH, concentration of Cr(VI) and amount of biomass on the adsorption capacity of the biosorbent were studied. The equilibrium adsorption data were fitted to Freundlich and Langmuir adsorption isotherm models and the model parameters are evaluated. In addition, the data were used to predict the kinetics of adsorption. The results indicated that the adsorption of Cr(VI) on fungi followed second order kinetics. The column flow adsorption data were used to predict break through curves. The fungi loaded with Cr(VI) was regenerated with 0.1 M NaOH solution and the regenerated biomass was used in the subsequent adsorption-desorption cycles. The experimental results demonstrated that the trametes versicolor polyporus fungi could be used as sorbent for immobilizing Cr(VI).

Keywords: Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherm Models, Adsorption-Desorption, Aqueous Solution, *Aspergillus-niger*, Biomass, Biosorbent, Biosorption, Capacity, Chromium, Chromium(VI), Column, Concentration, Cr(VI), Data, Equilibrium, Experimental, Flow, Freundlich, Heavy-Metal Biosorption, Isotherm, Isotherm Models, Kinetics, Kinetics of Adsorption, Langmuir, Langmuir Adsorption Isotherm, Lead(II), Mechanisms, Model, Models, Modified Biomass, NaOH, pH, Polyporus Fungi, Removal, Second Order, Second Order Kinetics, Second-Order, Solution, Sorbent, Sorption

? Karthikeyan, G. and Ilango, S.S. (2008), Adsorption of Cr(VI) onto activated carbons prepared from indigenous materials. *E-Journal of Chemistry*, **5** (4), 666-678.

Full Text: [2008\E-J Che5, 666.pdf](2008/E-J%20Che5,%20666.pdf)

Abstract: The adsorption of chromium(VI) on activated carbons prepared from low cost materials has been studied by batch process. The influences of various parameters like contact time, dosage, pH, pHzpc and co-ions were experimentally verified. The adsorption of Cr(VI) is maximum at strongly acidic medium (pH 3). Adsorption is explained using Langmuir and Freundlich isotherms with help of chi-square analysis. Thermodynamic parameters like ΔGº, ΔHº and ΔSº were calculated to understand the nature of adsorption. The surface morphology of the three activated carbons before and after metal sorption was verified using scanning electron microscope (SEM) and X-ray diffraction studies (XRD).

Keywords: Activated Carbons, Adsorption, Adsorption Isotherms, Analysis, Aqueous-Solution, Batch, Batch Process, Chi-Square, Chi-Square Analysis, Chromium, Chromium(VI), Cost, Cr(VI), Equilibrium, Fluoride, Freundlich, Freundlich Isotherms, Husk, Intraparticle Diffusion, Ions, Isotherms, Kinetics, Langmuir, Langmuir and Freundlich Isotherms, Low Cost, Metal, Metal Sorption, Morphology, pH, Removal, SEM, Sorption, Surface, Thermodynamic, Thermodynamic Parameters, X-Ray, X-Ray Diffraction, XRD

? Sujatha, M., Geetha, A., Sivakumar, P. and Palanisamy, P.N. (2008), Orthophosphoric acid activated babul seed carbon as an adsorbent for the removal of Methylene blue. *E-Journal of Chemistry*, **5** (4), 742-753.

Full Text: [2008\E-J Che5, 742.pdf](2008/E-J%20Che5,%20742.pdf)

Abstract: An Experimental and theoretical study has been conducted on the adsorption of methylene blue dye using activated carbon prepared from babul seed by chemical activation with orthophosphoric acid. BET surface area of the activated carbon was determined as 1060 m2/g. Adsorption kinetics, equilibrium and thermodynamics were investigated as a function of initial dye concentration, temperature and pH. First order Lagergren, pseudo-second order and Elovich kinetic models were used to test the adsorption kinetics. Results were analyzed by the Langmuir, Freundlich and Temkin isotherm models. Based on regression coefficient, the equilibrium data found fitted well to the Langmuir equilibrium model than other models. The characteristics of the prepared activated carbon were found comparable to the commercial activated carbon. It is found that the babul seed activated carbon is very effective for the removal of colouring matter.

Keywords: Activated Carbon, Activation, Adsorbent, Adsorption, Adsorption, Adsorption Kinetics, Aqueous-Solutions, BET, Bet Surface Area, Carbon, Characteristics, Chemical, Chemical Activation, Concentration, Data, Dye, Dyes, Elovich, Equilibrium, Equilibrium Model, Freundlich, Function, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Methylene Blue, Methylene Blue Dye, Model, Models, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Regression, Removal, Silica-Gel, Sorption, Surface, Surface Area, Surface-Chemistry, Temkin Isotherm, Temperature, Theoretical Study, Thermodynamics

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Full Text: [2008\E-J Che5, 761.pdf](2008/E-J%20Che5,%20761.pdf)

Abstract: Activated carbon prepared from Ricinus communis Pericarp was used to remove Ni(II) from aqueous solution by adsorption. Batch mode adsorption experiments are carried out by varying contact time, metal-ion concentration, carbon concentration and pH to assess kinetic and equilibrium parameters. The adsorption data were modeled by using both Langmuir and Freundlich classical adsorption isotherms. The adsorption capacity (Q(o)) calculated from the Langmuir isotherm was 31.15 mg/g of activated carbon at initial pH of 5.0 +/- 0.2 for the particle size 125-250 mu m.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Isotherms, Aqueous Solution, Batch, Batch Mode, Capacity, Carbon, Equilibrium, Freundlich, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Lead(II), Metal Ion, Metal Ion Concentration, Ni(II), pH, Removal, Ricinus Communis, Sorption

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Full Text: [2008\E-J Che5, 802.pdf](2008/E-J%20Che5,%20802.pdf)

Abstract: Expanded graphite (EG) is a kind of important adsorbent for organic compound such as oil and dyes. We have investigated the adsorption kinetics characteristics of this adsorbent for dye. EG was prepared with 50 mesh crude graphite through chemical oxidation intercalation of potassium permanganate and vitriol, and dye of acid red 3B was used as model sorbate. We have studied the adsorption kinetic models and rate-limiting step of the process. Adsorption rate and activation energy of the adsorption process were calculated. Kinetic studies show that the kinetic data are well described by the pseudo second-order kinetic model. The equilibrium adsorbance increases with the increase of the initial acid red 3B concentration. Initial adsorption rate increases with the increase of the initial dye concentration and temperature. Adsorption process of acid red 3B on EG has small activation energy. Internal diffusion appears to be the rate-limiting step for the adsorption process.

Keywords: Acid Red 3B, Activated-Sludge Biomass, Activation, Activation Energy, Adsorbent, Adsorption, Adsorption Kinetic, Adsorption Kinetics, Adsorption Rate, Aqueous-Solution, Basic-Dyes, Carbon, Characteristics, Chemical, Chemical Oxidation, Concentration, Congo Red, Data, Diffusion, Dye, Dyes, Energy, Equilibrium, Expanded Graphite, Graphite, Kinetic, Kinetic Model, Kinetic Models, Kinetic Studies, Kinetics, Linked Chitosan Beads, Methylene-Blue, Model, Models, Organic, Oxidation, Permanganate, Potassium, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Rate Limiting Step, Rate-Limiting Step, Reactive Dyes, Removal, Second Order, Second-Order, Small, Sorbate, Temperature

? Vasu, A.E. (2008), Surface modification of activated carbon for enhancement of nickel(II) adsorption. *E-Journal of Chemistry*, **5** (4), 814-819.

Full Text: [2008\E-J Che5, 814.pdf](2008/E-J%20Che5,%20814.pdf)

Abstract: A carbon prepared from coconut shells by simple carbonization was oxidized with different oxidizing agents, namely, hydrogen peroxide, ammonium persulphate and nitric acid. The surfaces of the unoxidized and oxidized carbons were characterized by Boehm and potentiometric titrations and IR spectra. The carbon materials prepared were tested for their ability to remove Ni(II) ions from aqueous solutions by batch mode adsorption experiments. Oxidations increased the surface acidic groups on the carbon which resulted in increased affinity of the carbon towards Ni(II).

Keywords: Acid, Activated Carbons, Adsorption, Ammonium, Aqueous Solutions, Batch, Carbon, Carbonization, Carbons, Coconut Shells, Enhancement, Heavy-Metals, Hydrogen Peroxide, Ions, IR, Isotherm, Modification, Ni(II), Ni(II) Adsorption, Nickel(II), Oxidation, Peroxide, Shells, Surface Chemistry, Water-Adsorption

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Full Text: [2008\E-J Che5, 820.pdf](2008/E-J%20Che5,%20820.pdf)

Abstract: A carbonaceous adsorbent prepared from an indigenous waste by acid treatment was tested for its efficiency in removing chromium ion. The parameters studied include agitation time, initial chromium ion concentration, carbon dose, pH and temperature. The adsorption followed first order reaction equation and the rate is mainly controlled by intra-particle diffusion. Freundlich and Langmuir isotherm models were applied to the equilibrium data. The adsorption capacity (Q(m)) obtained from the Langmuir isotherm plots were 27.40, 26.06, 26.06 and 26.17 mg/g respectively at an initial pH of 7.0 at 30, 40, 50 and 60 degrees C. The temperature variation study showed that the chromium ion adsorption is endothermic and spontaneous with increased randomness at the solid solution interface. Significant effect on adsorption was observed on varying the pH of the chromium ion solutions. Almost 70% removal of chromium ion was observed at 60 degrees C. The Langmuir and Freundlich isotherms obtained, positive Delta H(0) value, pH dependent results and desorption of dye in mineral acid suggest that the adsorption of chromium ion on PDC involves physisorption mechanism.

Keywords: Acid, Acid Treatment, Activated Carbon (Pdc), Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherms, Aqueous-Solutions, Capacity, Carbon, Chromium, Chromium Ion, Desorption, Diffusion, Dye, Dyes, Endothermic, Equilibrium, First Order, Freundlich, Freundlich Isotherms, Intra-Particle Diffusion, Intraparticle Diffusion, Intraparticle Diffusion and Regeneration Pattern, Isotherm, Isotherm Models, Isotherms, Kinetic and Thermodynamic Parameters, Langmuir, Langmuir and Freundlich Isotherms, Langmuir Isotherm, Mechanism, pH, pH-Dependent, Removal, Significant, Spontaneous, Temperature, Thermodynamic, Treatment

? Vasu, A.E. (2008), Studies on the removal of Rhodamine B and Malachite Green from aqueous solutions by activated carbon. *E-Journal of Chemistry*, **5** (4), 844-852.

Full Text: [2008\E-J Che5, 844.pdf](2008/E-J%20Che5,%20844.pdf)

Abstract: Activated carbon prepared from tamarind fruit shells by direct carbonization was used for the removal of rhodamine B and malachite green dyes from aqueous solutions. Adsorption studies were performed by varying such parameters as dye concentration, pH of the dye solution, time and temperature. The equilibrium adsorption data obtained were used to calculate the Freundlich, Langmuir and Redlich-Peterson isotherm parameters. Increase in pH of the solution pH resulted in increased adsorption of both the dyes. Kinetic studies indicate that the pseudo-second order model can be used for describing the dynamics of the sorption processes. Film diffusion of the dyes was the rate determining step at low dye concentrations while diffusion of dyes through the pores the carbon particles determined the overall uptake at high concentrations. Thermodynamic parameters of the endothermic sorptions were evaluated using van’t Hoff equation. Desorption studies with acids were also performed in order to regenerate the used carbons.

Keywords: Activated Carbon, Adsorption, Aqueous Solutions, Carbon, Carbonization, Concentration, Data, Desorption, Diffusion, Dye, Dye Removal, Dyes, Dynamics, Endothermic, Equilibrium, Film Diffusion, Freundlich, Isotherm, Isotherm Parameters, Kinetic, Kinetic Studies, Langmuir, Malachite Green, Model, Oxidation, Particle Diffusion, Particles, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Redlich-Peterson, Removal, Rhodamine B, Rhodamine-B, Solution, Solutions, Sorption, Temperature, Textile Dyes, Thermodynamic, Thermodynamic Parameters, Uptake, Waste-Water

? Rahatgaonkar, A.M. and Mahore, N.R. (2008), A selective bioreduction of toxic heavy metal ions from aquatic environment by Saccharomyces cerevisiae. *E-Journal of Chemistry*, **5** (4), 918-923.

Full Text: [2008\E-J Che5, 918.pdf](2008/E-J%20Che5,%20918.pdf)

Abstract: The need to remove or recover metal ions from industrial wastewater has been established in financial as well as environmental terms. This need has been proved financially in terms of cost saving through metal reuse or sale and environmentally as heavy metal toxicity can affect organisms throughout the food chain, including humans. Bioremediation of heavy metal pollution remains a major challenge in environmental biotechnology. Current removal strategies are mainly based on bioreduction of Co(++), Ni(++), Cu(++) and Cd(++) to their metallic forms by Saccharomyces cerevisiae in buffered aqueous solution. The rate of biotransformation was significantly influenced by pH of aqueous solution, concentration of biomass and hardness of water. All reaction conditions were optimized and maximum reduction of Co(++), Cd(++), Ni(++) and Cu(++) were observed as 80%, 63%, 50%, and 44% respectively. Unreacted Co(++), Cd(++), Ni(++) metal ions were extracted by 8-hydroxyquinoline and Cu(++) by diethylthio carbamate in CHCl(3) at different pH. Furthermore, the concentrations of unreacted metal ions were established spectrophotometrically.

Keywords: Adsorption, Aqueous Solution, Biomass, Bioreduction, Bioremediation, Biosorption, Biotechnology, Biotransformation, Cr(VI), Environment, Environmental, Equilibrium, Heavy Metal, Heavy Metals Ions, Humans, Industrial Wastewater, Ions, Kinetics, Metal, Metal Ions, pH, Pollution, Reduction, Removal, Reuse, Saccharomyces Cerevisiae, Sargassum sp Biomass, Selective, Sorption, Toxicity, Wastewater, Water, Yeast

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Full Text: [2009\E-J Che6, 141.pdf](2009/E-J%20Che6,%20141.pdf)

Abstract: Modified silica gel was prepared to remove the heavy metal of chromium(III) from water sample. Silica gel was used as supporting material and the 2-mercaptoimidazole was immobilized onto surface silica so that the silica would have selective properties to adsorb the heavy metal chromium(III) through the formation of coordination compound between the 2-mercaptoimidazole and chromium(III). The characterization of modified silica gel was carried out by analyzing the Fourier Transform Infrared Spectrum of this material in order to ensure the immobilization of 2-mercaptoimidazole onto the surface. The effect of pH solution, initial concentration of chromium(III), and interaction time were investigated in batch mode to find the adsorption properties of chromium(III) onto modified silica. The condition optimum of these parameters was applied to determine the removal percentage of chromium(III) in water sample using the modified silica gel.

Keywords: 2-Mercaptomidazole, Adsorption, Adsorption Properties, Atomic-Absorption-Spectrometry, Batch, Characterization, Chromium(III), Cobalt(II), Extraction, Gel, Heavy Metal, ICP-AES, Immobilization, Metal, Minicolumn, Modified, Modified Silica, pH, Preconcentration, Preparation, Removal, Seawater, Silica, Silica Gel, Sorption, Speciation, Water, Water Samples

? Najim, T.S., Elais, N.J. and Dawood, A.A. (2009), Adsorption of copper and iron using low cost material as adsorbent. *E-Journal of Chemistry*, **6** (1), 161-168.

Full Text: [2009\E-J Che6, 161.pdf](2009/E-J%20Che6,%20161.pdf)

Abstract: In this study, pine fruit was used as solid adsorbent for removal of ferrous and copper ions from aqueous solutions through batch equilibrium technique. The influence of contact time, pH of the solution and initial concentration of metal ions on adsorbed amount of metal ions were investigated. 90 minutes of adsorption time was found sufficient to reach equilibrium for ferrous ion and 120 minutes for copper ion. Adsorption of metal ions were pH dependent and the results indicate the optimum pH for the removal of Fe2+ was found to be 5.0 and that of Cu2+ was 7.0, the highest adsorption capacity was found to be 4.8 and 14.1 mg of metal ion per gram of adsorbent at initial concentration of 22.22 mg/L and 57.6 mg/L of ferrous and copper ions respectively and would be higher with higher initial concentration. Ferrous ion was removed by 96.3-97.3% and copper ion by 94.1-96% along the whole range of initial concentrations. Isotherm studies showed that the data were best fitted to the Freundlich isotherm model. The kinetic data corresponded well with the pseudo-second order equation, suggesting that the adsorption process is presumably a chemisorption.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Aqueous Solutions, Aqueous-Solution, Batch, Behavior, Capacity, Chemisorption, Concentration, Copper, Copper Ion, Data, Equilibrium, Fibers, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Ions, Iron, Isotherm, Isotherm Model, Kinetic, Kinetics, Metal, Metal Ions, Metal Ions Removal, Metal-Ions, Methylene-Blue, Model, Pb, pH, pH-Dependent, Pine Fruit, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Resin, Solution, Solutions

? Odoemelam, S.A. and Eddy, N.O. (2009), Studies on the use of oyster, snail and periwinkle shells as adsorbents for the removal of Pb2+ from aqueous solution. *E-Journal of Chemistry*, **6** (1), 213-222.

Full Text: [2009\E-J Che6, 213.pdf](2009/E-J%20Che6,%20213.pdf)

Abstract: In view of increasing rate of lead pollution resulting from discharge of lead containing effluents by industries into the environment, this study was carried out to investigate the removal of Pb2+ from aqueous solutions by oyster, snail and periwinkle shells. The effects of contact time and concentration on adsorption, thermodynamics of sorption and distribution coefficients of the adsorbents were examined to optimize the conditions to be utilized for decontamination of effluents containing Pb2+. The study revealed that these materials are good adsorbents that can be used for the removal of Pb2+ from aqueous solution. Adsorption of Pb2+ by oyster, snail and periwinkle shells were found to conform to the classical models of Langmuir, Freundlich and Temkin adsorption isotherms. Thermodynamic consideration revealed that adsorption of Pb2+ by these materials was spontaneous and proceeded via chemical adsorption. The use of these materials for the removal of lead ion from aqueous solution is therefore advocated.

Keywords: Adsorbents, Adsorption, Adsorption Isotherms, Animal Shells, Aqueous Effluents, Aqueous Solution, Aqueous Solutions, Chemical Adsorption, Distribution Coefficients, Environment, Freundlich, Industries, Ion, Isotherms, Langmuir, Lead, Lead Ion, Lead Ions, Pb2+, Pollution, Removal, Shells, Sorption, Spontaneous, Thermodynamic, Thermodynamics

? Kannan, N. and Veemaraj, T. (2009), Removal of lead(II) ions by adsorption onto bamboo dust and commercial activated carbons - A comparative study. *E-Journal of Chemistry*, **6** (1), 247-256.

Full Text: [2009\E-J Che6, 247.pdf](2009/E-J%20Che6,%20247.pdf)

Abstract: Studies on the removal of lead(II) ions by adsorption onto indigenously prepared bamboo dust carbon (BDC) and commercial activated carbon (CAC) have been carried out with an aim to obtain data for treating effluents from metal processing and metal finishing industries. Effect of various process parameters has been investigated by following the batch adsorption technique at 30 +/- 1 degrees C. Percentage removal of lead(II) ions increased with the decrease in initial concentration and increased with increase in contact time and dose of adsorbent. Amount of lead(II) ions adsorbed increases with the decrease in particle size of the adsorbent. As initial pH of the slurry increased, the percentage removal increased, reached a maximum and the final solution pH after adsorption decreases. Adsorption data were modeled with the Freundlich and Langmuir isotherms, the first order kinetic equations proposed by Natarajan - Khalaf, Lagergren and Bhattacharya and Venkobachar and intra-particle diffusion model and the models were found to be applicable. Kinetics of adsorption is observed to be first order with intra-particle diffusion as one of the rate determining steps. Removal of lead(II) ions by bamboo dust carbon (BDC) is found to be favourable and hence BDC could be employed as an alternative adsorbent to commercial activated carbon (CAC) for effluent treatment, especially for the removal of lead(II) ions.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherms, Adsorption Technique, Bamboo, Bamboo Dust Carbon (BDC) And Commercial Activated Carbon(CAC), Batch, Batch Adsorption, Cac, Carbon, Carbons, Diffusion, Effluent, Effluent Treatment, First Order, Freundlich, Freundlich and Langmuir Isotherms, Industries, Intra-Particle Diffusion, Intra-Particle Diffusion Model, Intraparticle Diffusion, Ions, Isotherms, Kinetic, Kinetic Equations, Kinetics, Langmuir, Langmuir Isotherms, Lead(II), Metal, Model, Ph, Process Parameters, Removal, Removal of Lead(II) Ions, Treatment

? Rajalakshmi, R., Subhashini, S. and Lalitha, P. (2009), Usefulness of activated carbon prepared from industrial wastes in the removal of nickel from aqueous solution. *E-Journal of Chemistry*, **6** (2), 361-370.

Full Text: [2009\E-J Che6, 361.pdf](2009/E-J%20Che6,%20361.pdf)

Abstract: Elimination of heavy metals like nickel from waste water is an important subject in view of public health. In the present study, an attempt has been made to study the applicability of industrial by-products as potential metal adsorbents to remove nickel from aqueous solutions and polluted water. A direct proportionality between the percentage of Ni(II) removal and adsorbent dosage was noted. Maximum removal / recovery of nickel was achieved at pH range of 10-12 for all adsorbents. An optimum temperature of 40 degrees C for efficient removal of Ni(II) was observed. The effect of nickel adsorption was affected by salinity. The adsorption isotherm data confirmed to Freundlich and Langmuir isotherms. Conformation of data to the Lagergren’s rate equation indicated first order kinetics. The suitability of the industrial by-products in the successful removal of nickel from aqueous solution is quite obvious from the study.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption, Adsorption Isotherm, Aqueous Solution, Aqueous Solutions, By-Products, First Order, Freundlich, Freundlich and Langmuir Isotherms, Heavy Metals, Isotherm, Isotherms, Kinetics, Langmuir, Langmuir Isotherms, Metal, Metals, Ni(II), Nickel, Nickel Pollution, pH, Public Health, Recovery, Removal, Temperature, Waste Water, Water, Water Pollution

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Full Text: [2009\E-J Che6, 633.pdf](2009/E-J%20Che6,%20633.pdf)

Abstract: The silica-resacetophenone (SiO(2)-RATP) nanoparticles were used as a new sorbent for extraction of trace amounts of Pb(II) by batch technique. Conditions of the analysis such as preconcentration factor, effect of pH, sample volume, shaking time, elution conditions and effects of interfering ions for the recovery of analyte were investigated. The adsorption capacity of nanometer SiO(2)-RATP was found to be 167.24 mu mol/g at optimum pH and the detection limit (3 sigma) was 0.58 mu g/L. The adsorption equilibrium of Pb(II) on nanometer SiO(2)-RATP was achieved in 20 min. Adsorbed Pb(II) was easily eluted with 5 mL of 0.5 M hydrochloric acid. The maximum preconcentration factor was 60. The method was applied for the determination of trace amounts of Pb(II) in various natural water rivers.

Keywords: Acid, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Analysis, Atomic-Absorption-Spectrometry, Batch, Capacity, Chemically Modified SiO2-Nanoparticles, Contaminants, Elements, Elution, Equilibrium, Flow-Injection, Ions, Lead, Metal Ions, Nanoparticles, Natural, Natural Water, Online, Particles, Pb(II), pH, Preconcentration, Preconcentration and Separation, Ratp, Recovery, Resacetophenone, Solid-Phase Extraction, Sorbent, Sorption, Water

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Full Text: [2009\E-J Che6, 693.pdf](2009/E-J%20Che6,%20693.pdf)

Abstract: The adsorption of Mn(II) on indigenously prepared activated carbons (IPAC) from Bombax malabaricum, Pithecelobium dulse, Ipomea batatas and Peltaforum ferraginium have been studied. The effects of various experimental parameters have been investigated using batch adsorption technique. The extent of Mn(II) removal increased with decrease in initial concentration of the Mn(II), particle size of the adsorbent and increased with increase in contact time, amount of adsorbent used and the initial pH of the solution. Adsorption data were modeled using Freundlich and Langmuir adsorption isotherms and first order kinetic equations. The kinetics of adsorption was found to be first order with regard to intraparticle diffusion rate. The results indicate that such carbons could be employed as low cost adsorbents in waste water treatment for the removal of Mn(II).

Keywords: Activated Carbons, Activated Carbons-Indigenously Prepared, Adsorbent, Adsorbents, Adsorption, Adsorption Isotherms, Adsorption Technique, Batch, Batch Adsorption, Carbons, Diffusion, Experimental, First Order, Freundlich, Freundlich and Langmuir Adsorption Isotherms, Intraparticle Diffusion, Iron, Isotherms, Kinetic, Kinetic Equations, Kinetics, Kinetics of Adsorption, Langmuir, Langmuir Adsorption, Low Cost, Low Cost Adsorbents, Manganese, Mn(II), pH, Pore, Removal, Treatment, Waste Water, Water, Water Treatment

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Full Text: [2009\E-J Che6, 713.pdf](2009/E-J%20Che6,%20713.pdf)

Abstract: As excess of fluoride (> 1.5 mg/L) in drinking water is harmful to the human health, various treatment technologies for removing fluoride from groundwater and aqueous medium have been investigated in the past. Present investigation aims to develop chitosan coated silica (CCS) and to investigate the removal of fluoride by CCS through adsorption. Fourier transform infrared spectroscopy (FTIR), Scanning electron microscopy (SEM), Thermo gravimetric analysis (TGA), X-ray diffraction (XRD) were used for the characterization of the sorbent. The surface morphology of the CCS was observed using SEM. Series of batch adsorption experiments were carried out to assess parameters that influence the adsorption process. The factors investigated include the influence of pH, contact time, adsorbent dose and initial fluoride concentration. The studies revealed there is an enhanced fluoride sorption on CCS. The sorption data obtained at optimized conditions were subjected to Langmuir and Freundlich isotherms. The monolayer sorption capacity, Q degrees (44.4 mg/g) and binding energy b (0.010 L/mg) have been estimated using Langmuir isotherm. The kinetic studies indicate that the sorption of fluoride on CCS follows Pseudo second-order kinetics.

Keywords: Adsorbent, Adsorbent Dose, Adsorption, Adsorption, Alumina, Analysis, Aqueous Medium, Batch, Batch Adsorption, Binding, Brackish-Water, Capacity, Ccs, Characterization, Chitosan, Coated, Concentration, Data, Deflouridation, Defluoridation, Donnan Dialysis, Drinking Water, Drinking-Water, Electrodialysis, Electron Microscopy, Energy, Experiments, Fluoride, Fluoride Removal, Freundlich, FTIR, Groundwater, Health, Human, Human Health, Infrared Spectroscopy, Investigation, Ions, Isotherm, Isotherms, Kinetic, Kinetic Studies, Kinetics, Langmuir, Langmuir and Freundlich Isotherms, Langmuir Isotherm, Monolayer, Morphology, pH, Pseudo Second Order Kinetics, Pseudo Second-Order, Pseudo-Second-Order, Removal, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, SEM, Silica, Sorbent, Sorption, Sorption Capacity, Spectroscopy, Surface, Technologies, TGA, Treatment, Water, X-Ray, X-Ray Diffraction, XRD

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Full Text: [2009\E-J Che6, 729.pdf](2009/E-J%20Che6,%20729.pdf)

Abstract: The sorptive removal of nickel ion from aqueous solutions using modified ZSM-5 zeolites was investigated. Experiments were carried out as a function of solute concentration and different temperatures. Mesoporous material of ZSM-5 zeolite was modified with phosphoric acid by wet method. The modified zeolite was converted to Na+ form using aqueous NaHCO3 solution. The Na+ form of modified zeolite, represented as PNa2--ZSM-5 was characterized by XRD, BET, SEM and AAS techniques. It was then tested for ion exchange with aqueous Ni(SO4) solution. The Ni2+ content of the solution was analyzed by AAS. Phosphoric acid modified PNa2--ZSM-5 zeolite shows higher adsorption capacity than the parent Na-Y zeolite. Equilibrium modeling data were fit to linear Langmuir model then the Freundlich model. These parameter confirmed that sorption of Ni2+ is feasible spontaneous and endothermic.

Keywords: Adsorption, Adsorption Capacity, Aqueous Solutions, BET, Capacity, Concentration, Data, Endothermic, Equilibrium, Freundlich, Freundlich Model, Function, Heavy-Metals, Ion Exchange, Ion-Exchange, Isotherms, Langmuir, Langmuir Model, Mesoporous, Mesoporous Material, Model, Modeling, Modified, Modified Zeolites, Na+, Ni2+, Nickel, Nickel Removal, Nickel(II), Phosphoric Acid, Removal, SEM, Solution, Solutions, Sorption, Techniques, XRD, Zeolite, Zeolites, ZSM-5

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Full Text: [2009\E-J Che6, 737.pdf](2009/E-J%20Che6,%20737.pdf)

Abstract: A new, low cost, locally available biomaterial was tested for its ability to remove cationic dyes from aqueous solution. A granule prepared from a mixture of leafs, fruits and twigs of Muntingia calabura had been utilized as a sorbent for uptake of three cationic dyes, methylene blue (MB), methylene red (MR) and malachite green (MG). The effects of various experimental parameters (e.g., contact time, dye concentration, adsorbent dose and pH) were investigated and optimal experimental conditions were ascertained. Above the value of initial pH 6, three dyes studied could be removed effectively. The isothermal data fitted the Langmuir and Freundlich isotherm models for all three dyes sorption. The biosorption processes followed the pseudo-first order rate kinetics. The results in this study indicated that Muntingia calabura was an attractive candidate for removing cationic dyes from the dye wastewater.

Keywords: Adsorbent, Adsorption, Aqueous Solution, Biomaterial, Biosorption, Dye, Dyes, Equilibrium, Experimental, Freundlich, Freundlich Isotherm, Fruits, Isotherm, Isotherm Models, Isothermal, Kinetics, Langmuir, Low Cost, Malachite Green, Metal-Ions, Methylene Blue, Methylene Red, Mr, Muntingia Calabura, Orange Peel, pH, Pseudo-First Order, Pseudo-First-Order, Removal, Sorbent, Sorption, Uptake, Wastewater

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Full Text: [2009\E-J Che6, 949.pdf](2009/E-J%20Che6,%20949.pdf)

Abstract: The rate of adsorption of two reactive dyes, Reactive Black 5 and Reactive Red E onto palm kernel shell-based activated carbon was studied. The experiment was carried out to investigate three models: film diffusion model, film-surface and film-pore diffusion models. The results showed that the external coefficients of mass transfer decreased with increasing of initial adsorbate concentration. In addition, it was found that the adsorption process was better described by using the two resistance models, i.e. film-surface diffusion.

Keywords: Acid Dyes, Activated Carbon, Adsorption, Adsorption Process, Aqueous-Solution, Carbon, Diffusion, Dyes, Film-Pore Diffusion, Film-Surface-Pore Diffusion, Kinetics, Mass Transfer, Mass-Transfer, Model, Models, Palm Kernel Shell, Reactive Black 5, Reactive Dye, Reactive Dyes, Resistance, Shell

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Full Text: [2009\E-J Che6, 1029.pdf](2009/E-J%20Che6,%201029.pdf)

Abstract: The adsorption capacity of Helix aspera shell for Pb(2+), Zn(2+) and Ni(2+) has been studied. This shell has the potential of adsorbing Pb(2+), Zn(2+) and Ni(2+) from aqueous solution. The adsorption potentials of Helix aspera shell is largely influenced by the ionic character of the ions and occurred according to the order Pb(2+) > Ni(2+) > Zn(2+). The adsorption of Pb(II), Zn(II) and Ni(II) ions from aqueous solutions by Helix aspera shell is thermodynamically feasible and is consistent with the models of Langmuir and Freundlich adsorption isotherms. From the results of the study, the shell of Helix aspera is recommended for use in the removal of Pb(2+), Zn(2+) and Ni(2+) from aqueous solution.

Keywords: Adsorption, Adsorption Capacity, Adsorption Isotherms, Aqueous Solution, Aqueous Solutions, Capacity, Freundlich, Heavy Metal, Helix Aspera, Ion, Ions, Isotherms, Langmuir, Ni2+, Ni(II), Pb2+, Pb(II), Removal, Shell, Zn2+, Zn(II)

? Mohanty, D. and Samal, S. (2009), Selective removal of toxic metals like copper and arsenic from drinking water using phenol-formaldehyde type chelating resins. *E-Journal of Chemistry*, **6** (4), 1035-1046.

Full Text: [2009\E-J Che6, 1035.pdf](2009/E-J%20Che6,%201035.pdf)

Abstract: The concentration of different toxic metals has increased beyond environmentally and ecologically permissible levels due to the increase in industrial activity. More than 100 million people of Bangladesh and West Bengal in India are affected by drinking ground water contaminated with arsenic and some parts of India is also affected by poisoning effect of copper, cadmium and fluoride. Different methods have been evolved to reduce the arsenic concentration in drinking water to a maximum permissible level of 10 mu g/L where as various methods are also available to separate copper from drinking water. Of the proven methods available today, removal of arsenic by polymeric ion exchangers has been most effective. While chelating ion exchange resins having specific chelating groups attached to a polymer have found extensive use in sorption and pre concentration of Cu(2+) ions. Both the methods are coupled here to separate and preconcentrate toxic metal cation Cu(2+) and metal anion arsenate(AsO(4)(-)) at the same time. We have prepared a series of low-cost polymeric resins, which are very efficient in removing copper ion from drinking water and after coordinating with copper ion they act as polymeric ligand exchanger, which are efficiently removing arsenate from drinking water. For this purpose Schiff bases were prepared by condensing o-phenylenediamine with o-, m-, and p-hydroxybenzaldehydes. Condensing these phenolic Schiff bases with formaldehyde afforded the chelating resins in high yields. These resins are loaded with Cu(2+), Ni(2+), and Fe(3+) ions. The resins and the polychelates are highly insoluble in water. In powdered form the metal ion-loaded resins are found to very efficiently remove arsenate ion from water at neutral pH. Resins loaded with optimum amount of Cu(2+) ion is more effective in removing arsenate ions compared to those with Fe(3+) ion, apparently because Cu(2+) is a stronger Lewis acid than Fe(3+). Various parameters influencing the removal of the arsenate ion from drinking water to a concentration level below 20 mu g/L are studied.

Keywords: 4,4’-Diaminodiphenylether, Acid, Adsorption, Arsenate, Arsenate Separation, Arsenic, Bangladesh, Cadmium, Chelating Resins, Complex, Copper, Copper Ion, Cu2+, Drinking Water, Elution, Fluoride, Formaldehyde, Hydroxybenzaldehydes, India, Ion Exchange, Ion Exchange Resins, Ion Exchangers, Ion Uptake Behavior, Ion-Exchange, Ions, Ligands, Low Cost, Metal, Metal Ion Uptake, Metals, Ni2+, O-Hydroxyacetophenone, pH, Polymer, Removal, Schiff-Bases, Selective, Silica, Sorption, Toxic Metals, Water

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Full Text: [2009\E-J Che6, 1109.pdf](2009/E-J%20Che6,%201109.pdf)

Abstract: Carbon prepared from Ricinus Communis Pericarp (RCP) was used to remove a crystal violet dye from aqueous solution by an adsorption technique under varying conditions of agitation time, dye concentration, adsorbent dose and pH. Adsorption is influenced by pH, dye concentration, carbon concentration and contact time. Equilibrium was attained with in 60 min. Adsorption followed both Langmuir and Freundlich isotherm models. The adsorption capacity was found to be 48.0 mg/g at an initial pH of 6.8 +/- 0.2 for the particle size of 125-250 mu m.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Technique, Aqueous Solution, Capacity, Carbon, Crystal Violet, Dye, Equilibrium, Freundlich, Freundlich Isotherm, Isotherm, Isotherm Models, Isotherms, Langmuir, Ph, Removal, Ricinus Communis Pericarp Carbon (RCPC), Waste-Water

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Full Text: [2009\E-J Che6, 1125.pdf](2009/E-J%20Che6,%201125.pdf)

Abstract: Sorption of metallic cadmium from the pH adjusted aqueous solutions at varying initial concentrations onto an alluvial (clay) soil through batch sorption experiments was studied. The pH of the initial concentrations ranging between 50 mg/L to 250 mg/L was varied from 3.0 to 8.0. The sorption experiments were carried out for different durations and up to 16 hours. The cadmium continued to sorb till the last experimental pH=8. The experimental sorption data fitted very well with both Langmuir and Freundlich isotherm models and Freundlich model gave higher correlation coefficients. The pseudo-second order kinetics model was most agreeable with the experimental sorption data, whereas the pseudo-first order model was found to be insufficient.

Keywords: Aqueous Solutions, Batch, Cadmium, Clay, Correlation, Data, Experimental, Experiments, Freundlich, Freundlich Isotherm, Freundlich Model, Heavy Metals, Isotherm, Isotherm Models, Isotherms, Kinetic, Kinetic Models, Kinetics, Kinetics Model, Langmuir, Lead, Metal, Metals Toxicity, Model, Models, pH, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Soil, Solutions, Sorption, Till, Zinc

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Full Text: [2009\E-J Che6, 1167.pdf](2009/E-J%20Che6,%201167.pdf)

Abstract: The simultaneous adsorption of Pb(II) and Hg(II) on cottonseed carbon (CSC) was employed for the removal of these metals from wastewater. The influence of various factors such as agitation time, pH and carbon dosage on the adsorption capacity has been studied. Langmuir and Freundlich equation could be used to interpret adsorption data. Sorption kinetics has indicated that reversible first order kinetics model could be applied with film diffusion as the controlling mechanism.

Keywords: Adsorption, Adsorption Capacity, Capacity, Carbon, Cottonseed Carbon, CSC, Diffusion, First Order, Freundlich, Freundlich Isotherm, Hg(II), Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Lead(II) Adsorption, Mechanism, Mercury(II) Adsorption, Metals, Model, Pb(II), pH, Removal, Sorption, Sorption Kinetics, Wastewater

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Full Text: [2009\E-J Che6, 1260.pdf](2009/E-J%20Che6,%201260.pdf)

Abstract: A new, low cost, locally available biomaterial was tested for its ability to remove cationic dyes from aqueous solution. A sample of granulized Annona squmosa seeds had been utilized as a sorbent for uptake of three cationic dyes, methylene blue (MB), methylene red (MR) and malachite green (MG). The effects of various experimental parameters (e.g., contact time, dye concentration, adsorbent dose and pH) were investigated and optimal experimental conditions were ascertained. Above the value of initial pH 5, three dyes studied could be removed effectively. The isothermal data fitted the Langmuir model in the case of MB sorption and the Freundlich model for all three dyes sorption. The biosorption processes followed the pseudo first order rate kinetics. The results in this study indicated that granulized Annona squmosa seed was an attractive candidate for removing cationic dyes from the dye wastewater.

Keywords: Adsorbent, Adsorption, Annona Squmosa, Aqueous Solution, Biomaterial, Biosorption, Dye, Dyes, Equilibrium, Experimental, First Order, Freundlich, Freundlich Model, Isothermal, Kinetics, Langmuir, Langmuir Model, Low Cost, Malachite Green, Metal-Ions, Methylene Blue, Methylene Red, Model, MR, Orange Peel, P\pH, Pseudo-First-Order, Removal, Sorbent, Sorption, Uptake, Wastewater

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Full Text: [2009\E-J Che6, S1.pdf](2009/E-J%20Che6,%20S1.pdf)

Abstract: A carbonaceous adsorbent prepared from an indigenous waste, by acid treatment was tested for its efficiency in removing metal ions. The process parameters studied include agitation time, initial metal ions concentration, carbon dose, pH and temperature. The adsorption followed first order reaction equation and the rate is mainly controlled by intra-particle diffusion. Freundlich and Langmuir isotherm models were applied to the equilibrium data. The adsorption capacity (Q(m)) obtained from the Langmuir isotherm plot were found to around 30 mg/g at an initial pH of 7.0. The temperature variation study showed that the metal ions adsorption is endothermic and spontaneous with increased randomness at the solid solution interface. Significant effect on adsorption was observed on varying the pH of the metal ion solutions. The Langmuir and Freundlich adsorption isotherms obtained, positive Delta H(0) value, pH dependent results and desorption of metal ions in mineral acid suggest that the adsorption of metal ions on BBC involves chemisorption as well as physisorption mechanism.

Keywords: Acid, Acid Treatment, Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherms, Aqueous-Solutions, Capacity, Carbon, Chemisorption, Chromium, Desorption, Diffusion, Dye, Endothermic, Equilibrium, First Order, Freundlich, Intra-Particle Diffusion, Intraparticle Diffusion, Ions, Isotherm, Isotherm Models, Isotherms, Langmuir, Langmuir Isotherm, Mechanism, Metal, Metal Ion, Metal Ions, Orange Peel, pH, pH-Dependent, Process Parameters, Removal, Significant, Spontaneous, Temperature, Thermodynamic, Thermodynamic Parameters, Treatment

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Full Text: [2009\E-J Che6, 129.pdf](2009/E-J%20Che6,%20129.pdf)

Abstract: The present investigation deals with the utilization of modified pomegrenate peel (MPGP) and formaldehyde modified pomegrenate peel (FMPGP) as adsorbents for the removal of chromium Cr(VI) from aqueous solution. A series of experiments were conducted in a batch system to evaluate the effect of system variables. The effect of pH, initial Cr(VI) concentration, contact time, adsorbent dosage and temperature were considered. The optimal pH values of Cr(VI) removal by MPGP and FMPGP were 2.0 and 3.0 respectively. The time required for equilibrium was found to be about 100 minutes. The initial Cr(VI) concentration and adsorbent dosage was found to have large effect on the adsorption of Cr(VI). The maximum uptake capacities were 13.01 and 22.28 mg of Cr(VI) per gram of MPGP and FMPGP respectively. Adsorption kinetic data were tested using pseudo-first order, pseudo-second order, Elovich and intra-particle diffusion models. Kinetic studies showed that the adsorption followed a pseudo second order reaction due to the high correlation coefficient and the agreement between the experimental and calculated values of qe.The adsorption may follow intraparticle diffusion as well, due to the highest values of rate constants for the surface adsorption and intraparticle diffusion kinetic models, the higher values of rate constants are related to an improved bonding between Cr(VI) ions and adsorbent particle.The Dubinin-radushkevich, Freundlich and Tempkin models were the closest fit for the equilibrium data of MPGP and FMPGP.

Keywords: Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorbents, Adsorption, Adsorption, Adsorption Isotherm Equilibrium, Adsorption Kinetic, Aqueous Solution, Batch, Batch System, Chromium, Concentration, Contact Time, Copper, Correlation, Correlation Coefficient, Cr(VI), Cr(VI) Removal, Data, Diffusion, Elovich, Equilibrium, Experimental, Experiments, Formaldehyde, Freundlich, Heavy-Metals, Intra Particle Diffusion, Intra-Particle Diffusion, Intraparticle Diffusion, Investigation, Ions, Kinetic, Kinetic Models, Kinetic Studies, Models, Modified, Modified Pomegranate Peel, NOV, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Constants, Removal, Sawdust, Second Order, Second-Order, Solution, Sorption, Surface, Temperature, Toxic Chromium, Uptake, Utilization, Waste-Water

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Full Text: [2009\E-J Che6, 153.pdf](2009/E-J%20Che6,%20153.pdf)

Abstract: Modified pomegranate peel (MPGP) and formaldehyde modified pomegranate peel (FMPGP) were prepared and used as adsorbent for removal of Cr(VI) ions from aqueous solution using batch process. The temperature variation study of adsorption on both adsorbents revealed that the adsorption process is endothermic, from the positive values of ΔH°. These values lie in the range of physisorption. The negative values of ΔG° show the adsorption is favorable and spontaneous. On the other hand, these negative values increases with increase in temperature on both adsorbents, which indicate that the adsorption is preferable at higher temperatures. ΔS° values showed that the process is accompanied by increase in disorder and randomness at the solid solution interface due to the reorientation of water molecules and Cr(VI) ions around the adsorbent surface. The endothermic nature of the adsorption was also confirmed from the positive values of activation energy, Ea, the low values of Ea confirm the physisorption mechanism of adsorption. The sticking probability, S°, of Cr(VI) ion on surface of both adsorbents showed that the adsorption is preferable due to low values of S° (0< S° < 1), but S° values are lower for FMPGP indicating that the adsorption on FMPGP is more preferable.

Keywords: Activation, Activation Energy, Adsorbent, Adsorbents, Adsorption, Adsorption Process, Aqueous Solution, Batch, Chromium, Cr(VI), Disorder, Endothermic, Energy, Formaldehyde, Hand, Ions, Low-Cost Carbon, Mechanism, Modified, Modified Pomegranate Peel, Pomegranate, Removal, Sawdust, Spontaneous, Sticking Probability, Temperature, Thermodynamic, Thermodynamic Parameters, Water

? Soliman, M.H., Gado, H.S. and Kouraim, M.N. (2009), Chemical studies on the removal of iron from crude phosphoric acid using an Organosilicon compound. *E-Journal of Chemistry*, **6** (S1), S329-S341.

Full Text: [2009\E-J Che6, S329.pdf](2009/E-J%20Che6,%20S329.pdf)

Abstract: A new adsorbent has been developed to reduce the concentration of iron in crude Egyptian phosphoric acid. This adsorbent has been formed by the treatment of silicate compound derived from clay mineral with pi organic acceptor ligand to carry out the exchange of ions as well as complexation with iron. Several parameters (shaking time, temperature, sorbent mass, and batch factor) have been studied. The adsorption of iron from crude phosphoric acid was investigated. The various methods to characterize the adsorption of iron on organosilicon compound (OSC) were collectively evaluated in this study. According to the Langmiur model, the maximum monomolecular capacity (Q) is 122 mg/g and 122 mg/g with Freundlich model for an initial iron concentration of 2.37% contained in crude phosphoric acid. Characterization studies such as x-ray diffraction, infrared spectroscopy and electron scanning microscope were investigated to substantiate the nature of iron-OSC complexes.

Keywords: Acid, Adsorbent, Adsorption, Batch, Capacity, Characterization, Chemical Studies, Clay, Complexation, Crude Phosphoric Acid And Adsorption, Extraction, Freundlich, Freundlich Model, Ions, Iron, Model, Organosilicon Compound, Phosphoric Acid, Purification, Removal, Sorbent, TBP, Temperature, Treatment, Uranium

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Full Text: [2009\E-J Che6, S347.pdf](2009/E-J%20Che6,%20S347.pdf)

Abstract: A carbonaceous adsorbent prepared from an indigenous waste, by acid treatment was tested for its efficiency in removing nickel ion. The process parameters studied include agitation time, initial metal ion concentration, carbon dose, pH and temperature. The adsorption followed first order reaction equation and the rate is mainly controlled by intraparticle diffusion. Freundlich and Langmuir isotherm models were applied to the equilibrium data. The adsorption capacity (Q(m)) obtained from the Langmuir isotherm plot were found to around 43 mg/g at an initial pH of 7.0. The temperature variation study showed that the nickel ions adsorption is endothermic and spontaneous with increased randomness at the solid solution interface. Significant effect on adsorption was observed on varying the pH of the nickel ion solutions. The Langmuir and Freundlich adsorption isotherms obtained, positive Delta H(0) value, pH dependent results and desorption of metal ions in mineral acid suggest that the adsorption of nickel ion on MCC involves chemisorption as well as physisorption mechanism.

Keywords: Acid, Acid Treatment, Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherms, Aqueous-Solutions, Capacity, Carbon, Chemisorption, Desorption, Diffusion, Dyes, Endothermic, Equilibrium, First Order, Freundlich, Intraparticle Diffusion, Ions, Isotherm, Isotherm Models, Isotherms, Kinetic And Thermodynamic Parameters, Langmuir, Langmuir Isotherm, Mechanism, Metal, Metal Ion, Metal Ion Concentration, Metal Ions, Nickel, Nickel Ion, Nickel Ions, pH, pH-Dependent, Process Parameters, Removal, Significant, Spontaneous, Temperature, Thermodynamic, Treatment

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Full Text: [2009\E-J Che6, S363.pdf](2009/E-J%20Che6,%20S363.pdf)

Abstract: Adsorption of rhodamine B from aqueous solution on the surface of Moringa oliefera bark carbon was accomplished under the optimize conditions of temperature, concentration, pH, contact time and quantity of adsorbent. Spectrometric technique was used for the measurements of concentration of dye before and after adsorption. The percentage removal of rhodamine B was calculated. The values of % adsorption data for Moringa oliefera bark carbon system show better adsorption capacity. The experimental data are fitted to the Langmuir and Freundlich isotherm equations. The values of their corresponding constant were determined from the slope and intercepts of their respective plots. Thermodynamic parameters like Delta G(0), Delta H(0) and Delta S(0) were calculated. Rhodamine B-Moringa oliefera bark carbon system shows spontaneous and endothermic behaviour. The results of these investigations suggested that natural adsorbents can be utilized as adsorbent materials, because of their selectivity’s for the removal of dyes.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherm, Aqueous Solution, Aqueous-Solutions, Capacity, Carbon, Dye, Dyes, Endothermic, Equilibrium, Experimental, Freundlich, Freundlich Isotherm, Intraparticle Diffusion, Isotherm, Kinetic And Thermodynamic Parameters, Langmuir, Natural, pH, Removal, Rhodamine B, Rhodamine B (RDB), Rhodamine-B, Spontaneous, Temperature, Thermodynamic, Thermodynamic Parameters

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Full Text: [2010\E-J Che7, 65.pdf](2010/E-J%20Che7,%2065.pdf)

Abstract: Adsorption process by activated carbon is widely used for removal of dyes. Because of economical limits, activated carbon derived from low cost materials seem to be economical. The aim of this work is preparation of activated carbon from poplar wood and investigation of its ability to removal of (AR18) dye. In this work, we prepared the activated carbon by chemical activation method in electric furnace. In addition we have investigated effect of various parameters such as pH, contact time, dye concentration and adsorbent dosage on dye removal. Langmuir and Freundlich isotherm models have been investigated. Pseudo-first order, pseudo-second order and modified pseudo-first order kinetic models have been used for experimental data. The results showed that removal efficiency was increased with increasing of adsorbent dosage, contact time and decreasing of pH, but with increasing of dye concentration, the removal efficiency was decreased. Adsorption isotherm models showed that Langmuir isotherm model was best fitted onto collected data (r(2)>0.978). In addition, kinetic models showed that sorption of AR18 onto activated carbon prepared from poplar wood follows the pseudo-first order model (r(2)>0.9758).

Keywords: Acid-Orange-7, Acid-Red-18, Activated Carbon, Activation, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Isotherm, Adsorption Isotherm Models, Aqueous-Solutions, Carbon, Chemical, Chemical Activation, Concentration, Cost, Data, Degradation, Dye, Dye Removal, Dye Sorption, Dyes, Efficiency, Equilibrium, Experimental, Freundlich, Freundlich Isotherm, Investigation, Isotherm, Isotherm Model, Kinetic, Kinetic Models, Kinetics Study, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Low Cost, Model, Models, Modified, pH, Poplar Wood, Preparation, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Removal Efficiency, Removal of Dyes, Sorption, Time, Wood, Work

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Full Text: [2010\E-J Che7, 157.pdf](2010/E-J%20Che7,%20157.pdf)

Abstract: The batch removal of Cu(II) from aqueous solution using poly (furfural-acetone), (PFA) as adsorbent was investigated in this study. The influences of initial Cu(II) ion concentration (10 to 120 ppm), pH (4-8) and contact time have been reported. Adsorption of Cu(II) is highly pH-dependent and the result indicate that the optimum pH for the removal was found to be 6. At this pH a small amount of PFA, 2 g/L, could remove as much as 97% of Cu(II) from a solution of initial concentration 10 ppm. It was observed that an increase in initial concentration of Cu(II) leads to decrease in percent removal of Cu(II) and increase in amount of Cu(II) adsorbed per unit mass of PFA. The adsorption process of Cu(II) is tested with four isotherm models, Langmuir, Freundlich, Temkin and Dubinin-Radushkevich (D-R). It was found that all models were applicable and the maximum adsorption capacity was found to be 13.66 mg/g. From the isotherm constants it was confirmed that, the sorption process was physisorption.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Capacity, Adsorption Process, Aqueous Solution, Batch, Biosorption, Capacity, Copper(II), Cu(II), Equilibrium, Freundlich, Isotherm, Isotherm Constants, Isotherm Models, Langmuir, PFA, pH, pH-Dependent, Poly (Furfural -Acetone), Removal, Sorption, Water

? Vijaya, Y. and Krishnaiah, A. (2010), Column adsorption and desorption studies of fluoride on perchloric acid cross-linked calcium alginate beads. *E-Journal of Chemistry*, **7** (1), 265-270.

Full Text: [2010\E-J Che7, 265.pdf](2010/E-J%20Che7,%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 ground water have been investigated in the past. Present investigation aims to remove fluoride by perchloric acid cross-linked calcium alginate (PCA). Column flow adsorption data were utilized to obtain breakthrough curves and desorption experiment have been carried out with a view to recover the adsorbed fluoride and regenerate the PCA beads using 0.05 M EDTA. Fourier transform infrared spectroscopy (FTIR) and scanning electron microscopy (SEM) studies were used for the characterization of the adsorbent.

Keywords: Acid, Adsorbent, Adsorption, Alginate, Aqueous-Solution, Breakthrough Curves, Calcium, Characterization, Column, Cross-Linked, Defluoridation, Defluoridation, Desorption, Drinking Water, Edta, Fluoride, Ftir, Human, Microscopy, Pca, Removal, Sem, Treatment, Water

? Beulah, S.S. and Muthukumaran, K. (2010), Sorption studies of chromium(VI) and mercury(II) by high temperature activated carbon from Syzygium Jambolanum nut. *E-Journal of Chemistry*, **7** (1), 299-307.

Full Text: [2010\E-J Che7, 299.pdf](2010/E-J%20Che7,%20299.pdf)

Abstract: High temperature activated Syzygium Jambolanum nut carbon (HSJC) has been effectively used for the removal of Cr(VI) and Hg(II) from aqueous solution by batch experiments. Effect of pH, carbon dose and equilibration time were determined. Adsorption followed Freundlich and Langmuir isotherms. Kinetic studies indicated that the removal process followed reversible first order equation. Desorption of Cr(VI) was done with 1 M NaOH and 10% H(2)O(2) mixture and Hg(II) with 2% Na(2)S in 1% NaOH. The performance of HSJC was compared with a commercial activated carbon (CAC).

Keywords: Activated Carbon, Adsorption, Aqueous Solution, Batch, Batch Experiments, CAC, Carbon, Chromium(VI), Cr(VI), Desorption, Equilibration, First Order, Freundlich, Freundlich And Langmuir Isotherms, Hg(II), Isotherms, Kinetic, Kinetic Studies, Langmuir, Langmuir Isotherms, Naoh, pH, Removal, Removal Process, Sorption, Syzygium Jambolanum Nut Carbon, Temperature

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Full Text: [2010\E-J Che7, 531.pdf](2010/E-J%20Che7,%20531.pdf)

Abstract: A series of different activated carbons of both honeycomb and disc type were prepared by chemical activation of coconut shells with zinc chloride at different concentrations, without the use of a binder. The structures were characterized by N(2) adsorption at 77 K and scanning electron microscopy (SEM), and also some samples were characterized by immersion calorimetry in benzene. These were subsequently used in the adsorption of phenol in aqueous solution. The experimental results indicat that activation with zinc chloride produced a large development of microporosity with a micropore volume of 0.38 to 0.79 cm(3) g(-1), BET area between 725 and 1523 m(2) g(-1) and the capacity to adsorb phenol. In addition, the BET and Langmuir models were applied to isotherm data.

Keywords: Activated Carbons, Activation, Adsorption, Aqueous Solution, Capacity, Carbon Monoliths, Carbons, Characterization, Chemical Activation, Chloride, Coconut Shells, Development, Experimental, Gas, Honeycomb, Immersion, Isotherm, Langmuir, Methane, Microscopy, Olive Stones, Phenol, Phenol Adsorption, Preparation, Sem, Shells, Zinc

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Full Text: [2010\E-J Che7, 669.pdf](2010/E-J%20Che7,%20669.pdf)

Abstract: The potential feasibility of mango leaves powder (MLP) (Mangifera indica) for removal of dye (Grey BL) from aqueous solution was investigated. The effects of various experimental parameters were examined and optimal experimental conditions were decided. Above the value of initial pH 7, the dye studied could be removed effectively. The isothermal data fitted the Langmuir model or Freundlich model. The adsorption processes followed the pseudo-first-order rate kinetics. The results in this study indicated that mango leaf powder (MLP) was an attractive candidate for removing dye from dye wastewater.

Keywords: Adsorption, Aqueous Solution, Biomass, Biosorption, Coir Pith, Congo-Red, Dye, Dyes, Experimental, Feasibility, Freundlich, Freundlich Model, Grey Bl, Grey Bl Dye, Isothermal, Kinetics, Langmuir, Langmuir Model, Leaf Powder, Mango Leaves Powder, Model, Palm-Fruit Bunch, pH, Pseudo-First-Order, Removal, Residues, Waste-Water, Wastewater, Wastewaters, Wheat-Straw

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Full Text: [2010\E-J Che7, 721.pdf](2010/E-J%20Che7,%20721.pdf)

Abstract: Iron-cyanide complexes are present in soil and ground water due to anthropogenic inputs. We compared the adsorption of ferricyanide ion, on two commercial activated carbons (COM3 and COM4) and gamma-alumina (A1G) in aqueous solution. Isotherm parameters obtained from batch experiments of iron-cyanide complex adsorption on these adsorbents were carried-out. The mass of the adsorbents were varied at 40 mg, 60 mg and 100 mg and the inorganic ion initial concentrations, C(o) also varied between 3.04x10(-4) and 2.43x10(-3) mol/L. The equilibrium data obtained were tested by using the Langmuir and Freundlich isotherm models. These data fit well with the Langmuir and Freundlich isotherm models at this low inorganic ion initial concentration.

Keywords: Activated Carbon, Activated Carbons, Adsorbents, Adsorption, Adsorption Isotherms, Aqueous Solution, Batch, Carbons, Equilibrium, Ferricyanide Ion, Freundlich, Freundlich Isotherm, Gamma-Al2O3, Gamma-Alumina, Goethite, Iron-Cyanide Complexes, Isotherm, Isotherm Models, Langmuir, Mobility, Phosphate, Road Salt, Soil, Sorption, Surface, Water

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Full Text: [2010\E-J Che7, 757.pdf](2010/E-J%20Che7,%20757.pdf)

Abstract: m-Phenylenediamine was condensed with furfural in absence of catalyst at room temperature. The produced m-phenylenediamine-furfural resin was used for the removal of Cu(II) from aqueous solution. The pH for the optimum removal of Cu(II) was 6. The negative values of Gibbs free energy at low concentration of Cu(II) (20, 30 ppm) indicative of the spontaneous adsorption process, while, at higher Cu(II) concentration (40,50 ppm) the positive and weak values of Delta G degrees indicate that the process is feasible but non spontaneous. The values of Delta H degrees were positive indicating that the sorption process is endothermic. On the other hand, the values of activation energy (Ea) were inconsistent with the values of Delta H degrees both are positive and lie in the range of physisorption. The entropy Delta S degrees of the process was positive indicative of the randomness of the Cu(II) ions at the solid / liquid interface. The values of sticking probability S\* were less than one which indicate a preferable adsorption process and the mechanism is physisorption.

Keywords: Activation, Activation Energy, Adsorption, Adsorption Process, Aqueous Solution, Copper, Cu(II), Cu2+, Endothermic, Energy, Gibbs Free Energy, Hand, Ions, M-Phenylenediamine-Furfural Resin, Mechanism, Metals, pH, Removal, Resin, Sorption, Spontaneous, Sticking Probability, Temperature, Thermodynamic, Thermodynamic Parameters, Utilization

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Full Text: [2010\E-J Che7, 770.pdf](2010/E-J%20Che7,%20770.pdf)

Abstract: Activated carbons prepared from teak leaf (TLC), maize corn (MCC) and babool tree bark (BTBC) were used to study adsorption of red industrial dye under various experimental conditions. Effect of various experimental parameters such as initial concentration, adsorbent dosage, particle size, contact time and initial pH of solution was studied. Batch adsorption studies were carried out at room temperature (30+1 degrees C). Adsorption parameters were modeled by Freundlich and Langmuir isotherm models. Adsorption data were fitted with the Natarajan and Khalaf, Lagergren and Bhattacharya - Venkobachar equations. The high value of 21.28 was obtained from Langmuir plot indicates maize corn carbon (MCC) is the best low cost adsorbent. The adsorption process followed first order kinetics, with intra-particle diffusion as one of the rate limiting steps.

Keywords: Acid, Activated Carbons, Adsorbent, Adsorption, Adsorption Kinetics, Adsorption Process, Babool Tree Bark Carbon, Batch, Batch Adsorption, Carbon, Carbons, Diffusion, Dye, Experimental, First Order, Freundlich, Fruendlich Isotherms, Intra-Particle Diffusion, Intraparticle Diffusion, Isotherm, Isotherm Models, Kinetics, Langmuir, Langmuir Isotherm, Low Cost, Maize Corn Carbon, pH, Porosity, Red Industrial Dye, Removal, Teak Leaf Carbon, Temperature, Waste

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Full Text: [2010\E-J Che7, 967.pdf](2010/E-J%20Che7,%20967.pdf)

Abstract: Biosorption equilibrium and kinetics of Pb(II) and Hg(II) on coconut shell carbon (CSC) were investigated by batch equilibration method. The effects of pH, adsorbent dosage, contact time, temperature and initial concentration of Pb(II) and Hg(II) on the activated carbon of coconut shell wastes were studied. Maximum adsorption of Pb(II) occurred at pH 4.5 and Hg(II) at pH 6. The sorptive mechanism followed the pseudo second order kinetics. The equilibrium data were analysed by Langmuir, Freundlich and Dubinin-Radushkevich isotherm models. The equilibration data fitted well with both Langmuir and Freundlich isotherm model. The Langmuir adsorption capacity for Pb(II) was greater than Hg(II). The mean free energy of adsorption calculated from Dubinin-Radushkevich (D-R) isotherm model indicated that the adsorption of metal ions was found to be by chemical ion exchange. Thermodynamic parameter showed that the sorption process of Pb(II) onto SDC was feasible, spontaneous and endothermic under studied conditions. A comparison was evaluated for the two metals.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous-Solutions, Biosorption, Cadmium(II), CSC, Equilibrium, Freundlich Isotherm, Heavy-Metals, Hg(II), Hg(II) Ions, Isotherm, Isotherms, Kinetics, Kinetics, Langmuir, Lead(II) Ions, Mercury, Pb(II), Pb(II) Ions, Removal, Rice Husk Ash, Sorption, Thermodynamic, Waste-Water

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Full Text: [2010\E-J Che7, 975.pdf](2010/E-J%20Che7,%20975.pdf)

Abstract: The present investigation describes adsorption of crystal violet dye from its aqueous solution onto tamarind (Tamarindus indica) fruit shell powder. Initial concentration, agitation speed and pH with various temperature have been studied, in which pH was found to be most effective. The adsorption data were mathematically analyzed using adsorption isotherm like Freundlich and Langmuir isotherm to study adsorption mechanism of crystal violet onto this seed powder. Freundlich isotherm was found to be most applicable. The equilibrium data were applied to intra-particle diffusion and adsorption kinetics. The reaction was found to be pseudo second order.

Keywords: Acid Dye, Activated Carbon, Adsorption, Adsorption Isotherm, Adsorption Kinetics, Adsorption Mechanism, Agitation, Aqueous Solution, Aqueous-Solution, Basic Dye, Calcined Alunite, Concentration, Crystal Violet, Data, Diffusion, Dye, Equilibrium, Freundlich, Freundlich Isotherm, Industrial Waste-Water, Initial Concentration, Intra-Particle Diffusion, Intraparticle Diffusion, Investigation, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Leaf Powder, Mechanism, Orange Peel, pH, Pseudo Second Order, Pseudo-Second-Order, Reactive Dyes, Removal, Second Order, Second-Order, Solution, Tamarind, Temperature

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Full Text: [2010\E-J Che7, 1003.pdf](2010/E-J%20Che7,%201003.pdf)

Abstract: Removal of color from aqueous solution by using low cost easily available adsorbent was conducted by batch experiment. The potential of the low cost adsorbent (Marble powder - treated and untreated) to remove methylene red from aqueous solution were assessed at room temperature. Laboratory investigation of the potential of marble powder and sulphuric acid treated marble powder to remove dye color from aqueous solution has been studied. Parameters studied included pH, adsorbent dose, initial dye concentration and contact time. The influence of these system variables were investigated to observe the effect on the rate of dye uptake. Sulphuric acid treated marble powder has shown better adsorptive capacity than untreated marble powder and thus it has become an interesting option for dye removal from industrial effluents.

Keywords: Acid, Acid Dyes, Activated Carbon, Adsorbent, Adsorption, Aqueous Solution, Azo Dye, Batch, Biosorption, Capacity, Coir Pith, Congo Red, Dye, Dye Removal, Equilibrium, Kinetics, Low Cost, Methylene Red, Methylene-Blue, Ph, Removal, Rice-Husk, Sulphuric Acid, Sulphuric Acid Treated Marble Power (Satmp), Temperature, Untreated Marble Powder (UTMP), Uptake, Waste

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Full Text: [2010\E-J Che7, 1200.pdf](2010/E-J%20Che7,%201200.pdf)

Abstract: Coal fly ash was used to synthesize X-type zeolite by alkali fusion followed by hydrothermal treatment. Characteristics of the various Fly ash samples were carried out. Coal proximate analysis was done. Batch experiment was carried out for the adsorption of some heavy metal ions on to synthesized Zeolite. The cost of synthesized zeolite was estimated to be almost one-fifth of that of commercial 13X zeolite available in the market.

Keywords: Adsorption, Analysis, Batch, Coal Fly Ash, Fly Ash, Geopolymer, Heavy Metal, Heavy Metal Ions, Hydro Thermal Treatment, Ions, Metal, Metal Ions, Proximate Analysis, Removal, Synthesis, Treatment, Xrf Analysis, Zeolite

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Full Text: [2010\E-J Che7, 1296.pdf](2010/E-J%20Che7,%201296.pdf)

Abstract: Adsorption of Pb(II) and Zn(II) ions from aqueous solutions was studied in a batch system using modified human hair. The optimum conditions for the adsorption of Pb(II) and Zn(II) ions from aqueous solution by human hair were investigated by considering the extent of adsorption with respect to contact time, initial metal ion concentration and temperature. The results obtained indicates that the extent of metal ions removed decreases with increasing contact time but increased with increase in the initial metal ion concentration. The adsorption equilibrium data best fitted Freundlich adsorption isotherm. The adsorption of Pb(II) and Zn(II) ions onto human hair is endothermic, spontaneous and is characterised by increasing degree of orderliness.

Keywords: Adsorption, Adsorption Equilibrium, Adsorption Isotherm, Adsorption of Pb(II), Aqueous Solution, Aqueous Solutions, Batch, Biosorption, Carbon, Endothermic, Equilibrium, Freundlich, Freundlich Adsorption Isotherm, Human, Human Hair, Ions, Isotherm, Kinetics, Metal, Metal Ion, Metal Ion Concentration, Metal Ions, Modified, Pb2+, Pb(II), Removal, Spontaneous, Temperature, Thermodynamic, Zn2+, Zn(II)

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Full Text: [2010\E-J Che7, 1346.pdf](2010/E-J%20Che7,%201346.pdf)

Abstract: In the present study, expanded graphite (EG) was prepared with 50 mesh crude graphite through chemical oxidation and its adsorption kinetics and thermodynamic characteristics for polyethylene glycol (PEG) with different molecular weight (MW) in aqueous solution was investigated. We studied the influence of initial PEG concentration, temperature, pH and ionic strength on adsorption capacity. Langmuir constants and Gibbs free energy change (ΔGº) were calculated according to experimental data, respectively. Thermodynamic study indicates that all the equilibrium adsorbance increase with the rise in ionic strength. However, solution acidity does not have an obvious effect. Adsorption of EG for PEG with different MW is all types and PEG molecule lies flat on EG surface. Adsorption processes are all spontaneous. Kinetic studies show that the kinetic data can be delineated by pseudo second-order kinetic model. Second-order rate constants and the initial adsorption rate rise with the increasing of temperature and half-adsorption time decreases with the increasing of temperature. The adsorption activation energy of each PEG is less than 30 kJ mol-1, physical adsorption is the major mode of the overall adsorption process.

Keywords: Acidity, Activated Carbon, Activation, Activation Energy, Adsorption, Adsorption Capacity, Adsorption Kinetics, Adsorption Rate, Adsorption Thermodynamics, Aqueous Solution, Aqueous-Solution, Capacity, Characteristics, Chemical, Chemical Oxidation, Concentration, Data, Energy, Equilibrium, Exfoliated Graphite, Expanded Graphite, Experimental, Gibbs Free Energy, Graphite, Heavy Oils, Ionic Strength, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Linked Chitosan Beads, Mode, Model, Oxidation, pH, Physical, Polyethylene, Polyethylene Glycol, Pseudo Second Order, Pseudo Second-Order, Pseudo-Second-Order, Rate Constants, Reactive Dye, Recovery, Second Order, Second-Order, Solution, Sorption, Strength, Surface, Temperature, Thermodynamic, Thermodynamic Study, Thermodynamics

? Mugugan, T., Ganapathi, A. and Valliappan, R. (2010), Removal of grey BL from dye wastewater by derris (*Pongamia Glabra*) leaf powder by adsorption. *E-Journal of Chemistry*, **7** (4), 1454-1462.

Full Text: [2010\E-J Che7, 1454.pdf](2010/E-J%20Che7,%201454.pdf)

Abstract: The dye, Grey BL was adsorbed on an adsorbent prepared from mature leaves of the Pungan tree (Pongamia glabra). A batch adsorption study was carried out with variable adsorbate concentration, adsorbent amount and pH. Ninety three percent of the dye could be removed by 2 g of the derris leaf powder from 1 L of an aqueous solution containing 25 mg of the dye at 300 K. The adsorption followed pseudo first order kinetics with a mean rate constant of 3.73×10-3 min-1 and an intraparticle diffusion rate constant of 6.36×10-2 mg g-1 min(-0.5). A possible mechanism of adsorption was suggested on the basis of concurrently operating surface adsorption and pore diffusion. The experimental data yielded excellent fits with Langmuir and Freundlich isotherm equations. The Langmuir monolayer capacity had a mean value of 8.27 mg g-1. The results indicated that the dye, Grey BL, strongly interacts with a biomass-based adsorbent, the Derris (Pongamia glabra) leaf powder.

Keywords: Acid Dyes, Activated Carbon, Adsorbent, Adsorption, Aqueous Solution, Aqueous-Solution, Batch, Batch Adsorption, Capacity, Color Removal, Concentration, Data, Diffusion, Dye, Dye Adsorption, Dye Removal, Experimental, First, First Order, Fixed-Bed Adsorption, Freundlich, Freundlich Isotherm, Grey Bl, Intraparticle Diffusion, Isotherm, Isotherm Equations, Kinetics, Kinetics, Langmuir, Mechanism, Mechanism of Adsorption, Monolayer, Orange Peel, pH, Pith, Pongamia Glabra, Pore Diffusion, Pseudo First Order, Pseudo-First-Order, Rate Constant, Removal, Solution, Sorption, Surface, Value, Wastewater, Wastewaters

? Patel, H. and Vashi, R.T. (2010), Treatment of textile wastewater by adsorption and coagulation. *E-Journal of Chemistry*, **7** (4), 1468-1476.

Full Text: [2010\E-J Che7, 1468.pdf](2010/E-J%20Che7,%201468.pdf)

Abstract: The composite of wastewater treatment was carried out using activated charcoal as adsorbent to remove COD, BOD, color in which various parameters like adsorbent dose, contact duration, temperature and agitator speed were considered. The adsorbent behavior can be explained on the basis of Freundlich and Langmuir adsorption isotherm model. Maximum removal (87.6, 81.0 and 90.0%) of COD, BOD and color respectively was found at adsorbent dosage of 11 g/L. Also, the textile mill wastewater was treated with different doses of coagulants like alum, ferric sulphate and ferrous sulphate at constant contact duration (4 hours) and room temperature (300 K). Percentage reduction (maximum) corresponds to 80.2, 74.0 and 84.9% was obtained for removal of COD, BOD and color respectively.

Keywords: Activated Charcoal, Adsorbent, Adsorbent Dosage, Adsorbent Dose, Adsorption, Adsorption Isotherm, Adsorption Isotherm Model, Alum, Aqueous-Solution, Basic Dye, Behavior, Bod, Coagulation, Cod, Color, Composite, Duration, Dye Removal, Effluent, Freundlich, Isotherm, Isotherm Model, Langmuir, Langmuir Adsorption Isotherm, Model, Reduction, Removal, Room Temperature, Temperature, Textile Wastewater, Treatment, Wastewater, Wastewater Treatment

? Ibezim-Ezeani, M.U. and Anusiem, A.C.I. (2010), Effect of ionic charge on the adsorption of sodium-palmitate and sodium-laurate onto galena, hematite and cassiterite in aqueous solution. *E-Journal of Chemistry*, **7** (4), 1491-1497.

Full Text: [2010\E-J Che7, 1491.pdf](2010/E-J%20Che7,%201491.pdf)

Abstract: The effect of ionic charge on the adsorption of sodium-palmitate and sodium-laurate onto galena, hematite and cassiterite surfaces in aqueous media was studied. The adsorption capacities were determined as a function of adsorbate concentration in the presence of various anions and cations at pH 7.31 and 29 degrees C. Positively charged ions depressed the adsorption capacity in the order: K+ > Ba2+ > Al3+, showing a reverse correlation with the charge to size ratio of these ions indicating a possible expansion of the double layer that results from predominant diffusion effect and electrostatic effect to some extent. The negatively charged ion enhanced adsorption capacity in the order: PO43- > SO42- > NO3-. This is attributed to the compression of the double layer through electrostatic interaction. In all the studies the adsorption capacities for the adsorbents were in the order: galena > hematite > cassiterite corresponding to the trend in the specific surface area of the adsorbents.

Keywords: Adsorbents, Adsorption, Adsorption Capacities, Adsorption Capacity, Anions, Cadmium(II), Capacity, Charge, Chitosan, Collector Reagent, Concentration, Correlation, Diffusion, Electrostatic Interaction, Equilibrium, Function, Hematite, Interaction, Ions, Kinetics, Lead, Manihot-Sculenta Cranz, Media, Metal Ore, Model, pH, Removal, Size, Soap, Sorption, Specific Surface, Specific Surface Area, Surface, Surface Area, Surfaces, Trend, Waste Biomass

? Karthikeyan, S., Sivakumar, B. and Sivakumar, N. (2010), Film and pore diffusion modeling for adsorption of reactive red 2 from aqueous solution on to activated carbon prepared from bio-diesel industrial waste. *E-Journal of Chemistry*, **7** (S1), S175-S184.

Full Text: [2010\E-J Che7, 175.pdf](2010/E-J%20Che7,%20175.pdf)

Abstract: The bio-diesel industrial waste, Pongamia pinnata seed shell was utilized as a potential adsorbent for the toxic textile dye ‘Reactive Red 2’. Preliminary information was gathered by batch mode contact time adsorption studies, which include effect of pH, contact time, dye concentration and temperature. Plausible mechanism of the on going adsorption process and thermodynamic parameters involved were obtained by carrying out kinetic measurements. To identify whether the on going process is particle diffusion or film diffusion, the treatment given by Boyd and Reichenberg was employed.

Keywords: Adsorbent, Adsorption, Adsorption Process, Aqueous Solution, Batch, Bio-Diesel Industrial Waste, Diffusion, Dye, Film Diffusion, Information, Kinetic, Low-Cost Adsorbents, Mechanism, Modeling, Particle Diffusion, Peat, pH, Pongamia Pinnata, Pongamia Pinnata Seed Shell, Reactive Red 2, Removal, Sorption, Temperature, Textile Dye, Thermodynamic, Thermodynamic Parameters, Treatment, Waste, Water

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Full Text: [2010\E-J Che7, S27.pdf](2010/E-J%20Che7,%20S27.pdf)

Abstract: The present paper focuses on the sorption behavior of Cd2+ ion on clayey soil at different initial concentration at natural soil pH and sorption of Cd2+ ion in the presence of Cu2+ ion (competitive-ion solution) on clayey soil at different initial concentrations at the same soil pH. Sorption experiments were carried out for the agitation period of 1 to 10 days. It was observed that in both the cases concentration of both the metals remaining in the solution with the agitation time was non linear. Maximum adsorption capacities of Cd2+ ion in both the solutions were calculated. It was observed that sorption of Cd2+ ion was decreased in the presence of Cu2+ ion. It was concluded that as a result of competition of ions, sorption of Cd2+ decreased.

Keywords: Adsorption, Batch Sorption Experiment, Behavior, Cadmium, Cadmium, Cd2+, Contaminated Soil, Copper, Copper, Cu2+, Desorption, Ions, Kinetics, Metal, Metals, Natural, Non-Linear, pH, Soil, Soil pH, Soil Remediation, Sorption

? Patil, A.K. and Shrivastava, V.S. (2010), Removal of Cu(II) ions by *Leucaena Leucocephala* (Subabul) seed pods from aqueous solutions. *E-Journal of Chemistry*, **7** (S1), S377-S385.

Full Text: [2010\E-J Che7, S377.pdf](2010/E-J%20Che7,%20S377.pdf)

Abstract: In this method, Leucaena leucocephala seed pods (LLSP) have been used for removal of Cu(II) ions from aqueous solution. Batch adsorption experiments were conducted to study the effect of process parameters like pH, contact time initial Cu(II) ions concentration and adsorbent dose. The maximum adsorption of Cu(II) ions on Leucaena leucocephala seed pods was 94.17% at pH 5. The amount of metal adsorbed per unit weight of adsorbent increases with time and reach equilibrium after 30 minutes of shaking time for the different initial metal concentrations. The Freundlich and Langmuir isotherm equations were applied for the equilibrium adsorption data and the various isotherm parameters were evaluated. The obtained plots were linear as evident from R-2 values close to unity. The data agreed very well with the pseudo second-order kinetic model.

Keywords: Adsorption, Adsorption Kinetics, Biosorption, Copper, Cu(II), Equilibrium, Freundlich, Freundlich Isotherm, Kinetic Model, Langmuir, Langmuir Isotherm, Leucaena Leucocephala, Low-Cost Adsorbent, pH, Removal, Seed Pods, Waste, Water, Zinc

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Full Text: [2010\E-J Che7, S419.pdf](2010/E-J%20Che7,%20S419.pdf)

Abstract: Activated carbons (ACs) were prepared from the peels of Citrus documana, Citrus medica and Citrus aurantifolia fruits. Adsorption of fluoride onto these activated carbons was investigated. Effect of contact time in the removal of fluoride from aqueous solution at neutral pH was studied. Five kinetic models; the pseudo first-and second-order equations, intraparticle diffusion, pore diffusion and the Elovich equation, were selected to follow adsorption process. Adsorption of fluoride onto adsorbents could be described by pseudo second-order equation. Kinetic parameters; rate constants, equilibrium adsorption capacities and correlation coefficients, for each kinetic equation were calculated and discussed. The good fitting of kinetic data to pore diffusion and Elovich equations indicate that pore diffusion plays a vital role in controlling the rate of the reaction.

Keywords: Activated Carbons, Adsorption, Adsorption Kinetics, Carbon, Citrus Fruits, Defluoridation, Diffusion, Equilibrium, Kinetic, Kinetics, Models, pH, Removal, Sorption, Water

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Full Text: [2010\E-J Che7, S488.pdf](2010/E-J%20Che7,%20S488.pdf)

Abstract: Biosorption is one such emerging technology which utilized naturally occurring waste materials to sequester heavy metals from polluted water. In the present study cinnamon was utilized for Cr(VI) removal from aqueous solutions. It was found that a time of two hours was sufficient for sorption to attain equilibrium. The optimum pH was 2 for Cr(VI) removal. Temprature has little influence on the biosorption process. The Cr(VI) removal decreased with increase in temperature. The biosorption data was well fitted to Dubinin - Radushkevich (D-R), Freundlich and Tempkin adsorption isotherm models, although the correlation coefficient of Langmuir model was high but the calculated adsorption capacity did not agree with the experimental. The thermodynamic study reveals that the biosorption process is spontaneous and the spontaneity decreased with temperature increase and the process is exothermic accompanied by highly ordered adsorbate at the solid liquid interface. Delta H degrees values were negative and lie in the range of physical adsorption.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherm Models, Aqueous Solution, Aqueous Solutions, Biomass, Biosorption, Capacity, Chromium, Chromium(VI), Cinnamon, Correlation Coefficient, Cr(VI), Cr(VI) Removal, Equilibrium, Experimental, Freundlich, Heavy Metals, Heavy-Metals, Ions, Isotherm, Isotherm Models, Langmuir, Langmuir Model, Lead, Metals, Model, pH, Removal, Rhodamine-B, Sorption, Spontaneous, Temperature, Thermodynamic, Thermodynamic Study, Waste Materials, Water

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Full Text: [2010\E-J Che7, S504.pdf](2010/E-J%20Che7,%20S504.pdf)

Abstract: The performance of the low cost adsorbents such as sawdust and neem leaves powder in removing the heavy metals like Zn(II), Cu(II) and Cr(VI) from textile dye effluent are reported. Adsorbent dosage, pH and contact time were taken as parameters for biosorption study. Removal of heavy metal ions from the textile dye effluent increases with increase in adsorbent dosage. The influence of pH and contact time was maximum for removal of heavy metal ions. The presence of the decreased heavy metal toxicity in the treated textile dye effluent was evaluated through the percentage of seed germination of Vigna mungo L. On comparison, sawdust was found to be good adsorbent compared to neem leaves powder.

Keywords: Adsorbent, Adsorbent Dosage, Adsorbents, Aqueous-Solutions, Atomic Absorption Spectroscopy (AAS), Biosorption, Contact Time, Cr(VI), Cu(II), Dye, Effluent, Heavy Metal, Heavy Metal Ions, Heavy Metals, Heavy-Metals, Ions, Low Cost, Low Cost Adsorbents, Metal, Metal Ions, Metals, Neem, Ph, Removal, Sawdust, Seed Germination, Textile Dye, Toxicity, Vigna Mungo L, Zn(II)

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Full Text: [2010\E-J Che7, S511.pdf](2010/E-J%20Che7,%20S511.pdf)

Abstract: Chemically activated “Waste” Jute Fiber carbon has been effectively used for the removal of five organophosphorous pesticides (malathion, monocrotophos, methylparathion, phosphamidon and dimethoate) from aqueous solutions. The prepared activated jute fiber carbon was characterized by using Elemental analyzer and proximate analysis methods. The adsorption equilibrium was examined at 28 degrees C. Three different kinetic models, the pseudo first order, pseudo second order and Elovich kinetic models were selected to analyses the adsorption process. To compare the fitness of pseudo first order and pseudo second order, sum of the squares of the errors and correlation coefficient, r(2) values were calculated. The Elovich model was used to confirm the chemisorptions.

Keywords: 2,4-D, Activated Carbon, Adsorption, Bagasse Fly-Ash, Carbon, Characterization, Dissolved Organic-Matter, Equilibrium, Kinetic, Kinetics, Methyl Parathion Pesticide, Pesticides, Phase, Removal, Sorption, Sugar-Industry Waste, Waste Jute Fiber Carbon, Water

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Full Text: [2011\E-J Che8, 9.pdf](2011/E-J%20Che8,%209.pdf)

Abstract: The ability of zea mays dust carbon to remove malachite green from aqueous solutions has been studied for different adsorbate concentrations by varying the amount of adsorbent, temperature, pH and shaking time. Thermodynamic parameters such as Delta H degrees, Delta S degrees and Delta G degrees, were calculated from the slope and intercept of the linear plots. Analysis of adsorption results obtained at 303, 313, 323 and 333 K showed that the adsorption pattern on zea mays dust carbon seems to follow the Langmuir and Freundlich. The numerical values of sorption free energy indicate physical adsorption. The kinetic data indicated an intra-particle diffusion process with sorption being first order. The concentration of malachite green oxalate was measured before and after adsorption by using UV-visible spectrophotometer.

Keywords: Adsorbent, Adsorption, Aqueous Solutions, Aqueous-Solutions, Carbon, Diffusion, Dye, Energy, Equilibrium, First Order, Freundlich, Intra-Particle Diffusion, Intraparticle Diffusion, Kinetic, Langmuir, Malachite Green, Oxalate, pH, Removal, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters

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Full Text: [2011\E-J Che8, 185.pdf](2011/E-J%20Che8,%20185.pdf)

Abstract: The batch removal of ferrous ion from aqueous solution using low cost adsorbents such as Zea mays dust carbon(ZDC) under different experimental conditions were investigated in this study. The process parameters studied include agitation time, initial metal ion concentration, carbon dose, pH and temperature. The adsorption followed first order reaction equation and the rate is mainly controlled by intraparticle diffusion. Freundlich and Langmuir isotherm models were applied to the equilibrium data. The adsorption capacity (Q(m)) obtained from the Langmuir isotherm plot were found to 37.17, 38.31, 39.37 and 40.48 mg/g. The temperature variation study showed that the ferrous ions adsorption is endothermic and spontaneous with increased randomness at the solid solution interface. Significant effect on adsorption was observed on varying the pH of the ferrous ion solutions. The Langmuir and Freundlich adsorption isotherms obtained positive Delta H(0) value, pH dependent results and desorption of metal ions in mineral acid suggest that the adsorption of ferrous ion on ZDC involves physisorption mechanism.

Keywords: Acid, Activated Carbon, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Isotherms, Adsorption Kinetics, Aqueous Solution, Batch, Capacity, Carbon, Desorption, Diffusion, Endothermic, Equilibrium, Experimental, Ferrous Ion, First Order, Freundlich, Intraparticle Diffusion, Ions, Isotherm, Isotherm Models, Isotherms, Kinetics, Langmuir, Langmuir Isotherm, Low Cost, Low Cost Adsorbents, Mechanism, Metal, Metal Ion, Metal Ion Concentration, Metal Ions, pH, pH-Dependent, Process Parameters, Regeneration Pattern, Removal, Significant, Spontaneous, Temperature, Zea Mays Dust Carbon (Zdc)

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Full Text: [2011\E-J Che8, 333.pdf](2011/E-J%20Che8,%20333.pdf)

Abstract: The low cost adsorbent palm oil fuel ash (POFA) derived from an agricultural waste material was investigated as a replacement of current expensive methods for treating wastewater contaminated by Pb(II) cation. Adsorption studies were carried out to delineate the effect of contact time, temperature, pH and initial metal ion concentration. The experimental data followed pseudo second order kinetics which confirms chemisorptions. The values of Langmuir dimensionless constant, R-L and Freundlich constant, 1/n were less than 1 representing favorable process for adsorption. Thermodynamic parameters such as ΔG degrees, ΔH degrees and ΔS degrees, related to Gibbs free energy, enthalpy and entropy were evaluated. It was concluded that, chemically treated palm oil fuel ash (POFA) can be used successfully for adsorption of Pb(II) from aqueous solution.

Keywords: Adsorption, Equilibrium, Freundlich, Isotherm, Kinetics, Langmuir, Lead, Pb(II), pH, Removal, Thermodynamic, Thermodynamics, Wastewater

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Full Text: [2011\E-J Che8, 373.pdf](2011/E-J%20Che8,%20373.pdf)

Abstract: The sorption of manganese(II) and nickel(II) onto two adsorbents, kaolinite and bentonite from aqueous solution was studied in batch mode. Effect of pH, contact time, adsorbent dose, and initial metal ion concentration on adsorption was investigated. The adsorbents exhibit good sorption potential for manganese(II) and nickel(II) with a peak value at pH 5 and pH 6 respectively. More than 70% sorption occurred within 20 min for manganese(II) and nickel(II) and equilibrium was attained at 90 min. for manganese(II) and 120 min for nickel(II). Freundlich and Langmuir’s mathematical models were used to describe batch adsorption. The adsorption was found to be favourable with respect to both the isotherms. The adsorption of the two metal ions from aqueous solution onto two adsorbents followed pseudo-second order kinetics.

Keywords: Adsorption, Bentonite, Equilibrium, Freundlich, Heavy Metal Ions, Kaolinite, Kinetics, pH, Sorption

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Full Text: [2011\E-J Che8, 649.pdf](2011/E-J%20Che8,%20649.pdf)

Abstract: Malachite green adsorption from an aqueous solution onto activated Enteromorpha carbon has been studied experimentally using batch adsorption method. Adsorption kinetics and equilibrium were investigated as a function of initial dye concentration, pH, contact time and adsorbent dosage. Kinetics studies indicated that the adsorption followed pseudo second order reaction. Equilibrium data was analyzed using Langmuir and Freundlich isotherm models. The adsorption capacity of Enteromorpha was found to be 94.74%. On the basis of experimental results and the model parameters, it can be inferred that the carbonaceous Enteromorpha is effective for the removal of malachite green from aqueous solution.

Keywords: Activated Carbon, Adsorption, Adsorption, Adsorption Kinetics, Aqueous Solution, Aqueous-Solution, Congo-Red, Dye, Enteromorpha, Equilibrium, Freundlich, Freundlich Isotherm, Isotherm, Kinetics, Langmuir, Leaf Powder, Malachite Green, Malachite Green Dye, pH, Removal, Residues, Waste

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Full Text: [2011\E-J Che8, 739.pdf](2011/E-J%20Che8,%20739.pdf)

Abstract: Studies on the removal of two dyes (sulphanilic azo antipyrine and sulphanilic azo imidazole) from aqueous solution by adsorption on charcoal as an adsorbent were carried out. A series of experiments were under taken in a batch adsorption technique to access the effect of the process variables i.e. contact time, initial dye concentration, initial pH, adsorbent dose and temperature. Adsorbent dosage (0.1 g) higher value for both dyes. The equilibrium in the solution was observed within (35 min) of two sulphanilic dyes on charcoal. The equilibrium isotherms for both dyes were determined to describe the adsorption process. The results showed that the equilibrium data was fitted by of the Freundlich isotherms on charcoal surface. The result obtained shows that the adsorption isotherm for both dyes on charcoal was according to Giles classification. The thermodynamic factors such as Delta H, Delta G and Delta S were calculated.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption Isotherm, Adsorption Process, Adsorption Technique, Aqueous Solution, Aqueous-Solutions, Batch, Batch Adsorption, Charcoal, Color Removal, Dye, Dyes, Effluents, Equilibrium, Equilibrium Isotherms, Freundlich, Freundlich Isotherms, Isotherm, Isotherms, Organic Dyes, pH, Phenol, Removal, Sulphanilic Azo Dye, Temperature, Thermodynamic, Wastewaters, Water

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Full Text: [2011\E-J Che8, 803.pdf](2011/E-J%20Che8,%20803.pdf)

Abstract: Adsorptions of Erichrome Black T dye in aqueous solution on cotton stem activated carbon have been studied as a function of contact time, concentration and pH. Effect of various experimental parameters has been investigated at 39 +/- 1 degrees C under batch adsorption technique. The result shows that cotton stem activated carbon adsorbs dye to a sufficient extent. The physicochemical characterization and chemical kinetics was also examined for the same dye. The overall result shows that it can be fruitfully used for the removal of dye from wastewaters.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Technique, Aqueous Solution, Aqueous-Solution, Batch, Batch Adsorption, Carbon, Characterization, Dye, Dyes Removal, Erichrome Black T, Experimental, Fruit, Kinetics, Methylene-Blue, Natural Waste, pH, Physicochemical Properties, Removal, Waste, Wastewater, Wastewaters

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Full Text: 2011\E-J Che8, 887.pdf

Abstract: Two new thiazolidinone steroids namely sulfadiazino-imino- steroid (I) and 3-sulfonamoyl-phenyl-spiro[4-oxo-thiazolidin-2,2’steroid] (II) were prepared and characterized from their molecular weight determination and spectroscopic measurements. Compound II were physically immobilized onto polyurethane foams (PUFs) for the preconcentration of cadmium(II) from acidic aqueous media containing iodide ions. The kinetics of the retention step of cadmium(II) from aqueous solutions by compound II treated PUFs was studied. Particle diffusion was the most probable operating mechanism and did not control the kinetics of cadmium(II) retention by compound II immobilized PUFs. A preconcentration / separation procedure is presented for the solid phase extraction of trace cadmium(II) from aqueous media as its ternary complex ion associate with compound II in industrial wastewater samples onto compound II treated PUFs prior to determination by flame atomic absorption spectrometry (FAAS). Compound II treated PUFs sorbent was successfully packed in glass column for complete extraction and / or determination of trace concentrations of cadmium(II) in wastewater samples with satisfactory recovery (95 +/- 2.6). The cyclic voltammetry of compound II showed two well defined irreversible redox couples and suggested its possible use as complexing agent in stripping voltammetric determination of trace concentrations of toxic metal ions in wastewater.

Keywords: Absorption, Aqueous Solutions, Cadmium(II), Column, Complexing Agent, Control, Derivatives, Determination, Diffusion, Extraction, Industrial Wastewater, Ions, Kinetics, Mechanism, Metal, Metal Ions, Molecular, Polyurethane, Polyurethane Foam Sorbent, Preconcentration, Reagent, Recovery, Redox, Removal, Retention, Separation, Sorbent, Sorption, Spectrometry, Spectrophotometric Determination, Steroid, Thiazolidinone Steroids, Voltammetry, Wastewater

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Full Text: [2011\E-J Che8, 917.pdf](2011/E-J%20Che8,%20917.pdf)

Abstract: Radiotracer technique has been used to study the removal behavior of Ce(III) and Eu(III) ions from aqueous solutions by local clay. Adsorptive concentration (10(-4)-10(-6) mol dm(-3)), pH (ca 2.0-9.0) and temperature (303-333 K) were examined for assessing optimal conditions for removal of these ions. The adsorption phenomenon was highly dependent on the amount of the adsorbent concentrations. The uptake of ions, which fitted well for Freundlich isotherm, increased with increase in the temperature and no significant desorption took place in the studied temperature range. The energy of adsorption process for the both cations indicates that the adsorption phenomenon is of chemisorption type. The rate kinetics of the adsorption followed the first order rate kinetics.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Process, Aqueous Solutions, Behavior, Cations, Ce(III), Chemisorption, Clay, Desorption, Energy, Eu(III), Europium, Exchangers, First Order, Freundlich, Freundlich Isotherm, Gamma-Radiation, Hydrous Manganese, Ions, Isotherm, Kinetics, Mercury, Oxides, pH, Polyaniline, Radiotracer, Removal, Separation, Sorption, Temperature, Uptake

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Subject Categories:

Biochemical Research Methods: Impact Factor 4.282, / (2001)

Chemistry, Analytical: Impact Factor 4.282, / (2001)

? Fetsch, D., Fetsch, M., Mendez, E.M.P. and Havel, J. (1998), Humic acid capillary zone electrophoresis adsorption on capillary walls, separation in metal ion supplemented buffer and the fingerprints. *Electrophoresis*, **19** (14), 2465-2473.

Abstract: Capillary zone electrophoresis (CZE) in quartz tubes is often being used for the separation and characterization of humic acids (HA). A method was found to follow adsorption land kinetics) of humic acids on a fused-silica capillary wall. It was shown that the adsorption of humic acids on an uncoated capillary wall is high. The effect on sorption of additives to the background electrolyte (BGE) was studied. Sorption can be eliminated by adding magnesium(II) salts (14-50 mM) to the BGE (pH 3.40) with resultant highly reproducible electropherograms as well as detailed and expressive fingerprints for HA of different origin.

Keywords: Humic Acids, Capillary Zone Electrophoresis, Sorption, Separation, Fingerprints, Electroosmotic Flow, Substances, Resolution, Soil

Giard, J.C., Laplace, J.M., Rince, A., Pichereau, V., Benachour, A., Leboeuf, C., Flahaut, S., Auffray, Y. and Hartke, A. (2001), The stress proteome of *Enterococcus* faecalis. *Electrophoresis*, **22** (14), 2947-2954.

Full Text: [E\Electrophoresis22, 2947.pdf](E/Electrophoresis22,%202947.pdf)

Abstract: *Enterococcus* faecalis is a resident bacterium of the intestinal tract of humans and animals. This bacterium can be responsible for serious diseases and is one of the largest causes of hospital-based infections. This hardy organism resists many kinds of stresses and is used as a major indicator of the hygienic quality of food, milk, and drinking water. On the other side, enterococci seem to have beneficial role in the development of cheese aroma and are added in certain starter cultures. Since ten years, our laboratory has used the two-dimensional electrophoresis (2-DE) technique to study the response of E, faecalis to physical or chemical stresses as well as to glucose and total starvation. Twenty-seven protein spots on 2-D gels have been identified by N-terminal sequencing or Western blotting which make up the first proteome database of this species. The proteins were classified in four different groups according to their function and their regulation. The first group comprises well-characterized proteins with known protective functions towards stresses. The second group contains enzymes of catabolic pathways. Their implication in stress resistance seems not obvious. A third group are proteins induced in glucose-starved cells belonging to the CcpA regulon. Induction of these enzymes under starvation may serve to increase the scavenging capacity of the cells for nutrients or may be important to mobilize endogenous energetic reserves. Lastly, nine N-terminal amino acid sequences or open reading frames (ORF) showed no homologies with sequences in databases. A comprehensive description of stress proteins of E faecalis and analysis of their patterns of expression under different environmental conditions would greatly increase our understanding of the molecular mechanisms underlying the extraordinary capacity of this bacterium to survive under hostile conditions.

Keywords: *Enterococcus* Faecalis, Stress Response, Starvation Response, Proteome, Bacillus-Subtilis, Gene, Identification, Morphology, Expression, Resistance, Survival, Proteins, JH2-2

? Schmitt-Kopplin, P. and Frommberger, M. (2003), Capillary electrophoresis - mass spectrometry: 15 years of developments and applications. *Electrophoresis*, **24** (22-23), 3837-3867.

Abstract: Since its introduction in 1987, capillary electrophoresis-mass spectrometry (CE-MS) has developed to a well accepted multidimensional analytical approach complementary and/or competitive to classical MS-hyphenated separation techniques. The threefold combination of rapid developments of an exceptional separation technique, of selective mass detection possibilities, and of very mild ionization modes first allowed these progresses. This article shows the CE specificities that need to be well controlled/known, compared to classical and more routinely used liquid chromatography in the light of its coupling to MS. The major trends and developments over the last 15 years and most of the reviews and applications found in ISI Web of science and publisher databases are presented in a tabulated way. The reader can thus rapidly find existing CE-MS analysis techniques in his field of research and application (forensics, environment, bioanalytics, pharmaceutics, and metabolites).

Keywords: Analysis, Assisted-Laser-Desorption, Ionization, Atmospheric Pressure Chemical Ionization, Bioanalytics, Capillary Electrophoresis - Mass Spectrometry, Ce-ESI-Ms, Databases, Electrospray Ionization, Electrospray-Ionization Interface, Environment, Forensics, Ion-Cyclotron Resonance, Ionization, ISI, Mass Spectrometry, Matrix-Assisted Laser Desorption, Metabolites, Micellar Electrokinetic Chromatography, Performance Liquid-Chromatography, Quaternary Ammonium Herbicides, Recombinant-Human-Erythropoietin, Research, Review, Science, Solid-Phase Extraction, Time-of-Flight, Trends, Web of Science

? Schmitt-Kopplin, P. and Englmann, M. (2005), Capillary electrophoresis-mass spectrometry: Survey on developments and applications 2003-2004. *Electrophoresis*, **26** (7-8), 1209-1220.

Abstract: The major developments and applications related to CE-MS over the last two years (2003-2004) and most of the reviews and applications found in the ISI Web of Science and publisher data bases are presented in a tabulated way. This article complements our previous review “Capillary electrophoresis - mass spectrometry: 15 years of developments and applications”, Electrophoresis, 2003, 24, 3837-3867 [1] for the last two years 2003-2004. All cited articles were analyzed in a way to illustrate (i) in which journals CE-MS-related papers were mostly found over the last decades and (ii) which commercial CE-, MS-instrumentations or CE-MS combinations were mostly used in the European, Asian, and American continent. Additionally, like it was done in our last review, the reader will rapidly find applications classified as forensics, environment, bioanalytics, pharmaceutics, and metabolites.

Keywords: Bioanalytics, Capillary Electrophoresis, Degradation-Products, Diode-Array Detection, Electrospray Ionization, Electrospray-Ionization, Environment, Food Chemistry, Forensics, Heterocyclic Aromatic-Amines, Human Plasma, Interfaces, ISI, Journals, Mass Spectrometry, Metabolites, Metabolomics, Micellar Electrokinetic Chromatography, Papers, Peptide Analysis, Performance Liquid-Chromatography, Pharmaceuticals, Protein Identification, Proteomics, Review, Science, Solid-Phase Extraction, Web of Science

? Uselova-Vcelakova, K., Zuskova, I. and Gas, B. (2007), Stability constants of amino acids, peptides, proteins, and other biomolecules determined by CE and related methods: Recapitulation of published data. *Electrophoresis*, **28** (13), 2145-2152.

Abstract: The stability (affinity, association, binding, complexation, formation) constant characterizes binding interaction between the analyte and the complexing agent. Knowledge of the stability constant makes possible the prediction and estimation of the binding behavior of constituents (amino acids, peptides, proteins, drugs, antibiotics, enzymes, enantiomers) to their partners, and the finding of a suitable partner for the given analyte to form a stable complex. The present paper summarizes the stability constant determination methods and the approaches used to evaluate the experimental data. Further, the paper recapitulates the published stability constant values determined, mainly, by capillary electrophoretic methods, taken from the Web of Science database covering the last decade. Details of the experimental conditions employed for the determination of the stability constants are also given. The review attempts to give a critical evaluation of the problems that accompany the determination of stability constant and discusses their solution.

Keywords: Antibiotics, Association Constants, Beta-Cyclodextrin, Binding Constants, Binding Constants, Capillary-Zone-Electrophoresis, Chiral Separations, Contactless Conductivity Detection, Cze, Electromigration Techniques, Evaluation, Knowledge, Mass Spectrometry, Monte-Carlo-Simulation, Rectangular Hyperbolae, Review, Science, Stability Constants, Web of Science

# Title: Elements

Full Journal Title: Elements

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Heaney, P.J. (2007), What’s your h-index? *Elements*, **3** (4), 229-230.

Full Text: [2007\Elements3, 229.pdf](2007/Elements3,%20229.pdf)

Keywords: h Index, h-Index

# Title: EMBO Reports

Full Journal Title: EMBO Reports

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Wren, J.D., Grissom, J.E. and Conway, T. (2006), E-mail decay rates among corresponding authors in MEDLINE: The ability to communicate with and request materials from authors is being eroded by the expiration of e-mail addresses. *EMBO Reports*, **7** (2), 122-127.

Full Text: [2006\EMB Rep7, 122.pdf](2006/EMB%20Rep7,%20122.pdf)

Keywords: Electronic Mail, Internet, Medline, Networks, Persistence, Web References

? Wren, J.D., Grissom, J.E. and Conway, T. (2006), E-mail decay rates among corresponding authors in MEDLINE. *EMBO Reports*, **7** (4), 455.

Full Text: [2006\EMB Rep7, 455.pdf](2006/EMB%20Rep7,%20455.pdf)

Keywords: Medline

? Wren, J.D., Kozak, K.Z., Johnson, K.R., Deakyne, S.J., Schilling, L.M. and Dellavalle, R.P. (2007), The write position - A survey of perceived contributions to papers based on byline position and number of authors. *EMBO Reports*, **8** (11), 988-991.

Full Text: [2007\EMB Rep8, 988.pdf](2007/EMB%20Rep8,%20988.pdf)

Keywords: Coauthorship, Promotion, Journals

# Title: Emergencias

Full Journal Title: Emergencias

ISO Abbreviated Title: Emergencias

JCR Abbreviated Title: Emergencias

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Miro, O., Martin-Sanchez, F.J., Burillo-Putze, G., Julian, A., Tomas, S., Pacheco, A. and Sanchez, M. (2010), Bibliometric and publication quality markers of *Emergencias* from 2005 to 2009 and comparison with emergency medicine journals included in Journal Citation Reports. *Emergencias*, **22** (3), 165-174.

Abstract: Objectives: To calculate 5-year (2005-2009) quality and bibliometric indicators for Emergencias and compare them to those of other journals specialized in emergency medicine. Methods: Manual review of articles published in Emergencias and consultation of the Web of Science (WoS) database to record the following information for other journals for each year of the study period, number and type of articles published; number, nationality, professional affiliation, and academic degrees of authors; number and type of cites; and cites in both WoS-indexed journals and in Emergencias (self-citation). The self-citation rates, immediacy indices, and impact factors were calculated for Emergencias and compared with those of the 13 emergency medicine journals listed in Journal Citation Reports (JCR). Results: The number of manuscripts received by Emergencias increased significantly by 157%, going from 102 in 2005 to 262 in 2009. The total number of articles published increased from 87 to 128 (47%), while the number of original research articles grew from 26 to 43 (65%). The percentage of articles by non-Spanish authors also rose, from 2.3% to 10.2%, an increase of 335%. The number of cites rose from 12 to 117 (875% increase). The acceptance rate decreased significantly by 40%, going from 81% to 49%. Reviewer response time was also cut, by 53%, going from 55 to 26 days. Editorial decision time decreased from 142 to 62 days (reduction of 56%). The self-citation rate decreased significantly, descending to 43% in 2009, while the immediacy index increased to 0.16 in 2006 (0.689, counting self-citation). The impact factor excluding self-citation was 0.816 in 2009 (1.437, counting self-citation). Most of these indicators are within the range of the 13 comparable journals listed in the JCR in 2008. Conclusion: Emergencias has undergone highly favorable changes over the past 5 years, improving many of the main quality and bibliometric indicators. At the end of the study period the statistics for Emergencias were within the range calculated for emergency medicine journals in the JCR. [Emergencias 2010;22.165-174].

Keywords: Bibliometric, Bibliometrics, Citation, Emergency Health Services, Impact, Impact Factor, Journals, Medicine, Publication, Quality Indicators, Research, Scientific Journals, Self-Citation, Web of Science

? Rozman, C. (2010), EMERGENCIAS in the Science Citation Index Expanded. *Emergencias*, **22** (6), 406-407.

Keywords: Citation, Medicine, Science, Science Citation Index, Science Citation Index Expanded

# Title: Emergency Medicine Australasia

Formerly known as Emergency Medicine

Full Journal Title: [Emergency Medicine Australasia](http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=emm)

ISO Abbreviated Title: Emerg. Med. Australas

JCR Abbreviated Title: Emerg Med Australas

pISSN: 1742-6731

eISSN: 1742-6723

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Taylor, D.McD. and Brown, A.F.T. (2001), Analysis of the study design and manuscript deficiencies in research articles, submitted to *Emergency Medicine*. *Emergency Medicine Australasia*, **13** (4), 444-450.

Full Text: [E\Eme Med13, 444.pdf](E/Eme%20Med13,%20444.pdf)

Abstract: OBJECTIVE: To describe and analyse the study design and manuscript deficiencies in original research articles submitted to Emergency Medicine. METHODS: This was a retrospective, analytical study. Articles were enrolled if the reports of the Section Editor and two reviewers were available. Data were extracted from these reports only. Outcome measures were the mean number and nature of the deficiencies and the mean reviewers’ assessment score. RESULTS: Fifty-seven articles were evaluated (28 accepted for publication, 19 rejected, 10 pending revision). The mean (± SD) number of deficiencies was 18.1 ± 6.9, 16.4 ± 6.5 and 18.4 ± 6.7 for all articles, articles accepted for publication and articles rejected, respectively (P = 0.31 between accepted and rejected articles). The mean assessment scores (0-10) were 5.5 ± 1.5, 5.9 ± 1.5 and 4.7 ± 1.4 for all articles, articles accepted for publication and articles rejected, respectively. Accepted articles had a significantly higher assessment score than rejected articles (P = 0.006). For each group, there was a negative correlation between the number of deficiencies and the mean assessment score (P > 0.05). Significantly more rejected articles ‘ em leader did not further our knowledge’ (P = 0.0014) and ‘ em leader did not describe background information adequately’ (P = 0.049). Many rejected articles had ‘ em leader findings that were not clinically or socially significant’ (P = 0.07). Common deficiencies among all articles included ambiguity of the methods (77%) and results (68%), conclusions not warranted by the data (72%), poor referencing (56%), inadequate study design description (51%), unclear tables (49%), an overly long discussion (49%), limitations of the study not described (51%), inadequate definition of terms (49%) and subject selection bias (40%). CONCLUSIONS: Researchers should undertake studies that are likely to further our knowledge and be clinically or socially significant. Deficiencies in manuscript preparation are more frequent than mistakes in study design and execution. Specific training or assistance in manuscript preparation is indicated.

Taylor, D.McD. (2002), The appropriate use of references in a scientific research paper. *Emergency Medicine Australasia*, **14** (2), 166-170.

Full Text: [E\Eme Med14, 166.pdf](E/Eme%20Med14,%20166.pdf)

Abstract: References have an important and varied role in any scientific paper. Unfortunately, many authors do not appreciate this importance and errors within reference lists are frequently encountered. Most reference errors involve spelling, numerical and punctuation mistakes, although the use of too many, too few or even inappropriate references is often seen. The consequences of reference errors include difficulty in reference retrieval, limitation for the reader to read more widely, failure to credit the cited authors, and inaccuracies in citation indexes. This paper discusses the value of accurate reference lists and provides guidelines for their preparation.

# Title: Emergency Medicine Journal

Full Journal Title: Emergency Medicine Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1472-0205

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Schull, M.J. (2003), Sex, SARS, and the Holy Grail. *Emergency Medicine Journal*, **20** (5), 400-401.

Full Text: [2003\Eme Med J20, 400.pdf](2003/Eme%20Med%20J20,%20400.pdf)

? Seow, E. (2003), SARS: Experience from the emergency department, Tan Tock Seng Hospital, Singapore. *Emergency Medicine Journal*, **20** (6), 501-504.

Full Text: [2003\Eme Med J20, 501.pdf](2003/Eme%20Med%20J20,%20501.pdf)

? Raja, U.Y. and Cooper, J.G. (2006), How accurate are the references in *Emergency Medical Journal*? *Emergency Medicine Journal*, **23** (8), 625-626.

Full Text: [2006\Eme Med J23, 625.pdf](2006/Eme%20Med%20J23,%20625.pdf)

Abstract: Objective: To determine the accuracy of references in Emergency Medicine Journal during 2003. Materials and methods: All references cited in Emergency Medicine Journal during 2003 were examined carefully, and the accuracy of the citations was checked against reliable electronic and manual resources. References were categorised as correct or incorrect. The errors were classified as minor if the integrity of the reference was not greatly compromised and major if the error severely detracted from the quality of the reference. Results: Overall, errors were found in 19% of all citations checked (n = 2561), and in 8% the errors were major and markedly detracted from the quality of the reference. Conclusions: Citation errors reflect badly on authors and the publishing journal and may reflect underlying flaws in other areas of the research published. It is hoped that identification of this problem will lead to attempts to improve the accuracy of reference citation in the emergency medicine literature and to an improvement in the credibility of research in our specialty.

Keywords: Accuracy, Accuracy of References, Anesthesia, Citation, Citations, Credibility, Emergency, Emergency Medicine, Error, Errors, Ethics, Identification, Improvement, Journal, Lead, Literature, Medicine, Methods, Minor, Publishing, Quality, Quality of, Reference, References, Research, Specialty, Surgery

? Locker, T., Goodacre, S., Sampson, F., Webster, A. and Sutton, A.J. (2006), Meta-analysis of plethysmography and rheography in the diagnosis of deep vein thrombosis. *Emergency Medicine Journal*, **23** (8), 630-635.

Full Text: [2006\Eme Med J23, 630.pdf](2006/Eme%20Med%20J23,%20630.pdf)

Abstract: Background: Plethysmography and rheography techniques have been widely studied as diagnostic tests for deep vein thrombosis (DVT). This study aimed to systematically review the accuracy of these tests for diagnosing clinically suspected DVT. Methods: The following databases were searched: MEDLINE, EMBASE, CINAHL, Web of Science, Cochrane Database of Systematic Reviews, Cochrane Controlled Trials Register, Database of Reviews of Effectiveness, the ACP Journal Club (1966 to 2004), and citation lists of retrieved articles. Studies that compared plethysmography or rheography to a reference standard of ultrasound or contrast venography were selected. Standardised data were extracted and study quality determined against validated criteria. Data were analysed by random effects meta-analysis and meta-regression. Results: The meta-analysis included 78 studies, reporting 82 patient cohorts. Sensitivity and specificity (95% CI) were: 75% (73% to 77%) and 90% (89% to 91%) for impedance plethysmography, 83% (81% to 85%) and 81% (79% to 82%) for strain-gauge plethysmography, 85% (79% to 90%) and 91% (81% to 95%) for air plethysmography, 91% (87% to 94%) and 71% (66% to 75%) for light-reflex rheography, and 86% (83% to 89%) and 93% (91% to 95%) for phleborheography. Meta-regression was limited by poor reporting of studies. There was some evidence that diagnostic performance depended on the proportion of males in the cohort and reporting of study setting. Conclusions: Although plethysmography and rheography techniques add diagnostic value, they have inadequate diagnostic performance to act as a stand-alone test in DVT diagnosis. Evaluation of their role in combination with other tests, or standardised clinical assessment, is required.

Keywords: Accuracy, Air Plethysmography, Assessment, Citation, Cochrane, D-Dimer, Databases, Deep Vein Thrombosis, Diagnosis, Doppler Ultrasound, Effectiveness, Embase, Evaluation, Impedance Plethysmography, Journal, Light-Reflection Rheography, Lower-Extremity, Meta Analysis, Meta-Analysis, Methods, Noninvasive Screening-Test, Review, Science, Strain-Gauge Plethysmography, Systematic, Thrombosis, Ultrasound, Vascular-Laboratory Diagnosis, Venous Thrombosis, Web of Science

? Ghai, B., Saxena, A.K. and Makkar, J.K. (2007), A guide to reducing citation errors in bibliographies. *Emergency Medicine Journal*, **24** (3), 232-233.

Full Text: [2007\Eme Med J24, 232.pdf](2007/Eme%20Med%20J24,%20232.pdf)

Keywords: Accuracy, Bibliographies, Citation, Citation Errors, Errors, Mar, References

? Lee, R.S., Woods, R., Bullard, M., Holroyd, B.R. and Rowe, B.H. (2008), Consultations in the emergency department: A systematic review of the literature. *Emergency Medicine Journal*, **25** (1), Article Number: 4.

Full Text: [2008\Eme Med J25, 4.pdf](2008/Eme%20Med%20J25,%204.pdf)

Abstract: Objectives: Consultation is a common and important aspect of emergency department (ED) practice which can lead to delays in patient flow. Little is known about ED consultations and this review systematically evaluated the literature on ED consultations. Methods: Comprehensive searches of MEDLINE, PUBMED, SCIRUS, Cochrane Library, Web of Science, Health Star and other databases from 1966 to 2007 were performed. The grey literature and reference lists were searched and authors were contacted to identify other eligible studies. Published and unpublished studies reporting the proportion of consultations in the ED using any type of design were considered for this review. Eligible studies were required to involve patients presenting to the ED. Studies reporting on the proportion of consultation in a specific subpopulation of patients and interventions to improve consultations were also considered for inclusion. Two reviewers independently selected studies and extracted data from included studies regarding the proportion of consultations in the ED or the patient subgroup. Individual study proportions were calculated together with 95% confidence intervals (CI). Results: From more than 15 000 pre-screened citations, 12 studies were finally included in the review. All but three of the included studies were published. Overall, four studies examined ED consultation proportions, six identified the rate of consultation for special populations of ED presentations and two examined interventions to improve consultations. Consultation varied from 20% to 40% for all patients, with lower proportions in the selected populations studied and a high rate of hospitalisation for consulted patients. Limited research on interventions to improve the ED consultation process has also been completed. Conclusions: Consultation research in the emergency setting is limited and variable; however, high consultation rates exist in some centres. This systematic review outlines the current state of the literature and suggests that further research is urgently needed.

Keywords: Accident, Audit, Authors, Citations, Cochrane, Confidence Intervals, Consultation, Databases, Emergency Department, Health, Hospital Emergency, Interventions, Lead, Literature, Medicine, Medline, Methods, Outcomes, Physicians, Practice, Psychiatric-Consultation, Referral Patterns, Research, Review, Science, Service, Systematic, Systematic Review, Trauma, Web of Science

? Burls, A., Cabello, J.B., Emparanza, J.I., Bayliss, S. and Quinn, T. (2011), Oxygen therapy for acute myocardial infarction: A systematic review and meta-analysis. *Emergency Medicine Journal*, **28** (11), 917-923.

Full Text: [2011\Eme Med J25, 917.pdf](2011/Eme%20Med%20J25,%20917.pdf)

Abstract: Oxygen (O(2)) is widely recommended in international guidelines for treatment of acute myocardial infarction (AMI), but there is uncertainty about its safety and benefits. A systematic review and meta-analysis were performed to determine whether inhaled O(2) in AMI improves pain or the risk of death. Cochrane CENTRAL Register of Controlled Trials, MEDLINE, MEDLINE In-Process, EMBASE, CINAHL, LILACS and PASCAL were searched from start date to February 2010. Other sources included British Library ZETOC, Web of Science, ISI Proceedings, relevant conferences, expert contacts. Randomised controlled trials of inhaled O(2) versus air in patients with suspected or proven AMI of < 24 h onset were included. Two authors independently reviewed studies to confirm inclusion criteria met, and undertook data abstraction. Quality of studies and risk of bias was assessed according to Cochrane Collaboration guidance. Main outcomes were death, pain, and complications. Measure of effect used was the RR. Three trials (n=387 patients) were included. Pooled RR of death on O(2) compared to air was 2.88 (95% CI 0.88 to 9.39) on ITT analysis and 3.03 (95% CI 0.93 to 9.83) in confirmed AMI. While suggestive of harm, this could be a chance occurrence. Pain was measured by analgesic use. Pooled RR for the use of analgesics was 0.97 (95% CI 0.78 to 1.20). Evidence for O(2) in AMI is sparse, of poor quality and pre-dates advances in reperfusion and trial methods. Evidence is suggestive of harm but lacks power and excess deaths in the O(2) group could be due to chance. More research is required.

Keywords: Acute, Acute Coronary Syndromes, Acute Myocardial Infarction, Analysis, Authors, Beliefs, Bias, Blood-Flow, Cochrane, Collaboration, Complications, Embase, Guidelines, Hyperoxia, ISI, Management, Medline, Meta Analysis, Meta-Analysis, Myocardial Infarction, Outcomes, Pain, Patients, Power, Quality, Research, Resuscitation, Review, Risk, Safety, Science, St-Segment Elevation, Systematic, Systematic Review, Therapy, Treatment, Web of Science

# Title: Emerging Infectious Diseases

Full Journal Title: [Emerging Infectious Diseases](http://www.cdc.gov/ncidod/EID/pastcon.htm)

ISO Abbreviated Title: Emerg. Infect. Dis

JCR Abbreviated Title: Emerg Infect Dis

ISSN: 1080-6040

Issues/Year: 6

Journal Country/Territory: United States

Language: English

Publisher: Center Disease Control

Publisher Address: Atlanta, GA 30333

Subject Categories:

Immunology Infectious Diseases: Impact Factor

Inglis, T.J.J., Garrow, S.C., Henderson, M., Clair, A., Sampson, J., OReilly, L. and Cameron, B. (2000), *Burkholderia pseudomallei* traced to water treatment plant in Australia. *Emerging Infectious Diseases*, **6** (1), 56-59.

Full Text: [E\Eme Inf Dis6, 56.pdf](E/Eme%20Inf%20Dis6,%2056.pdf)

Abstract: *Burkholderia pseudomallei* was isolated from environmental specimens 1 year after an outbreak of acute melioidosis in a remote coastal community in northwestern Australia. B. pseudomallei was isolated from a water storage tank and from spray formed in a pH-raising aerator unit. Pulsed-field gel electrophoresis confirmed the aerator and storage tank isolates were identical to the outbreak strain, WKo97.

Inglis, T.J.J., Garrow, S.C., Henderson, M., Clair, A., Sampson, J., OReilly, L. and Cameron, B. (2000), *Burkholderia pseudomallei* traced to water treatment plant in Australia. *Emerging Infectious Diseases*, **6** (1), 56-59.

Full Text: [E\Eme Inf Dis6, 56.pdf](E/Eme%20Inf%20Dis6,%2056.pdf)

Hsu, L.Y., Lee, C.C., Green, J.A., Ang, B., Paton, N.I., Lee, L., Villacian, J.S., Lim, P.L., Earnest, A. and Leo, Y.S. (2003), Severe acute respiratory syndrome (SARS) in Singapore: Clinical features of index patient and initial contacts. *Emerging Infectious Diseases*, **9** (6), 713-717.

Full Text: [E\Eme Inf Dis9, 713.pdf](E/Eme%20Inf%20Dis9,%20713.pdf)

Abstract: Severe acute respiratory syndrome (SARS) is an emerging viral infectious disease. One of the largest outbreaks of SARS to date began in Singapore in March 2003. We describe the clinical, laboratory, and radiologic features of the index patient and the patient’s initial contacts affected with probable SARS.

Twu, S.J., Chen, T.J., Chen, C.J., Olsen, S.J., Lee, L.T., Fisk, T., Hsu, K.H., Chang, S.C., Chen, K.T., Chiang, I.H., Wu, Y.C., Wu, J.S. and Dowell, S.F. (2003), Control measures for severe acute respiratory syndrome (SARS) in Taiwan. *Emerging Infectious Diseases*, **9** (6), 718-720.

Full Text: [E\Eme Inf Dis9, 718.pdf](E/Eme%20Inf%20Dis9,%20718.pdf)

Abstract: As of April 14, 2003, Taiwan had had 23 probable cases of severe acute respiratory syndrome (SARS), 19 of which were imported. Taiwan isolated all 23 patients in negative-pressure rooms, extensive personal protective equipment was used for healthcare workers and visitors. For the first 6 weeks of the SARS outbreak, recognized spread was limited to one healthcare worker and three household contacts.

# Title: Enabling Interaction and Quality: Beyond the Hanseatic League

Full Journal Title: Enabling Interaction and Quality: Beyond the Hanseatic League

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Ganslandt, T., Schnetz, E., Williamson, E. and Prokosch, H.U. (2006), Experience with a system for the acquisition and bibliometric evaluation of publications based on an ASP approach. *Enabling Interaction and Quality: Beyond the Hanseatic League*, 63-68.

Abstract: Measurement of scientific output by bibliometric analysis of peer-reviewed publications has been established internationally. The process of acquiring published references in a structured, quality-controlled dataset varies widely and is often carried out ineffectively. In this paper we describe the design, implementation and production use experience of an online platform for the acquisition and integrated bibliometric analysis of publications. The system “EVALuna Biblio” is currently in use at 3 German medical faculties. Integrated interfaces for the Medline databases and commonly used reference file formats enabled both an effective acquisition process as well as high data quality. Flexible filter criteria and analysis schemes allowed semi-automated evaluation runs as well as multiple reuse of the acquired data.

Keywords: Bibliometric Analysis, Evaluation, Publications

# Title: Encyclopedia of Library and Information Science

Full Journal Title: Encyclopedia of Library and Information Science

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Weinstock, M. (1971), Citation indexes (part I). in *Encyclopedia of Library and Information Science*, (Edited by Kent, A. *et al.*), Marcel Dekker, Inc., New York, **5**, 16-40.

Full Text: [E\Ess Inf Sci1971, 188.pdf](E/Ess%20Inf%20Sci1971,%20188.pdf)

# Title: Encyclopedia of Surface and Colloid Science

Full Journal Title: [Encyclopedia of Surface and Colloid Science](http://www.informaworld.com/smpp/title~db=all~content=t713172975)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Gupta, V.K. and Ali, I. (2002), Adsorbents for water treatment: Low-cost alternatives to carbon. in *Encyclopedia of Surface and Colloid Science* (Ed. Arthur Hubbard), Marcel Dekker, Inc., New York, 136-166.

Full Text: [E\Enc Sur Col Sci-Gupta.doc](E/Enc%20Sur%20Col%20Sci-Gupta.doc)

Abstract: Adsorption involves the accumulation of a substance at a surface or interface. The process can occur at an interface between any two phases such as liquid-liquid, gas-liquid, gas-solid, or liquid-solid. The material being adsorbed is known as adsorbate, and the adsorbing phase is termed as adsorbent. Drinking water contains in excess about 700 organic compounds alone, these being derived from a wide range of municipal, industrial, and agricultural operations as well as from the natural decomposition of the animal and vegetable matter.1 Adsorption technology is currently being used extensively for the removal of organic and inorganic micropollutants from the aqueous phase,2, 3 and since its first introduction in the 1940s, the activated carbon has been the water industry’s standard adsorbent for the reclamation of municipal and industrial wastewater to a potable water quality.4, 5 The use of carbon adsorption for the direct treatment of liquid industrial waste streams is a relatively recent practice but has been successfully utilized for the reclamation of metals from electroplating wastes and the removal of phenol from chloroalkali plant wastewater prior to recycling.6

Despite the prolific use of this adsorbent in wastewater, carbon adsorption remains an expensive treatment process. This has prompted a growing research interest into the production of low-cost alternatives to activated carbon from a range of carbonaceous and mineral precursors.7-97, 8, 9 Many of the starting materials for these replacement adsorbents are from the agricultural or industrial by-products; hence their use as secondary adsorbents contributes to the waste minimization, recovery, and reuse.10 The aim of this article is to draw together the extensive literature, which has developed around the preparation of inexpensive adsorbents, and to provide an assessment of their relevance and suitability for waste and wastewater treatment.

Keywords: Adsorption, Wastewater Treatment, Low-Cost Adsorbents, Alternatives to Carbon, Activated Carbons, Waste Materials

? Alkan, M. and Doğan, M. (2002), Perlite surfaces. in *Encyclopedia of Surface and Colloid Science* (Ed. Arthur Hubbard), Marcel Dekker, Inc., New York, 3945-3958.

Full Text: [2002\Enc Sur Col Sci2002, 3945.pdf](2002/Enc%20Sur%20Col%20Sci2002,%203945.pdf)

Abstract: In the early 20th century, researchers discovered that some rocks, including perlite, expanded when rapidly heated. Perlite, a glassy volcanic rock, expands to about 20 times its original volume upon heating within its softening temperature range of 760° to 1090°C.1, 2

Keywords: Perlite, Surface Chemistry, Zeta Potential

? Gupta, V.K. and Ali, I. (2003), Adsorbents for water treatment: Development of low-cost alternatives to carbon. in *Encyclopedia of Surface and Colloid Science* (Ed. Arthur Hubbard), Marcel Dekker, Inc., New York, 1-34.

Full Text: [E\Enc Sur Col Sci2003, 1.doc](E/Enc%20Sur%20Col%20Sci2003,%201.doc)

# Title: Endeavour

Full Journal Title: Endeavour

ISO Abbreviated Title: Endeavour

JCR Abbreviated Title: Endeavour

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Cawkell, A.E. (1977), Science perceived through the Science Citation Index. *Endeavour*, **1** (2), 57-62.

Full Text: [1960-80\Endeavour1, 57.pdf](1960-80/Endeavour1,%2057.pdf)

Keywords: Citation, Science Citation Index

# Title: Endocrine Journal

Full Journal Title: Endocrine Journal

ISO Abbreviated Title: Endocr. J.

JCR Abbreviated Title: Endocr J

ISSN: 0918-8959

Issues/Year: 6

Journal Country/Territory: Japan

Language: English

Publisher: Japan Endocrine Society

Publisher Address: C/O Dept Veterinary Physiol, Vet Med Sci, Univ Tokyo, 1-1-1 Yayoi, Bunkyo-K

Subject Categories:

Endocrinology & Metabolism: Impact Factor

? Ozbakir, O., Dogukan, A. and Kelestimur, F. (1995), The prevalence of thyroid-dysfunction among elderly subjects in an endemic goiter area of central anatolia. *Endocrine Journal*, **42** (5), 713-716.

Abstract: The prevalence of thyroid dysfunction in the elderly is reported to be markedly high, at least in some Western countries in which iodine intake is sufficient or increased because of recent supplementation of iodine for public health. We therefore wished to investigate the prevalence of thyroid dysfunction among elderly people in an endemic goiter area. The study included 198 subjects over the age of 55 years. It was carried out in two towns 20-30 km, south of Kayseri, Central Anatolia. Questioning on medical history, physical examination and grading of thyroid gland size were performed. Serum TSH was measured by a sensitive immunoradiometric assay. Serum free thyroid hormones and thyroid autoantibodies were measured in the subjects with TSH concentrations below 0.4 µIU/ml or above 4.5 µIU/ml on the initial screen. Drinking water was also analyzed for iodine content. Twenty-five (12.6%) subjects had either elevated (6.5%) or suppressed (6.1%) serum TSH levels. No patient had clinical hypothyroidism (high TSH and low free thyroxine and free triiodothyronine). Three (3.5%) subjects had clinical hyperthyroidism (low TSH and high free thyroxine and free triiodothyronine). Only one subject was positive for antimicrosomal and antithyroglobulin antibodies. The prevalence of goiter was 25.8%. The iodine level in drinking water was found to be 3 µg/L. In conclusion, we believe that the prevalence of thyroid dysfunction in the elderly may depend on the iodine status in the environment. We think that hyperthyroidism due to multinodular goiter is more important than hypothyroidism for elderly people living in an endemic goiter area, probably due to the low frequency of autoimmune thyroid disorders.

# Title: Endocrinology

Full Journal Title: Endocrinology

ISO Abbreviated Title: Endocrinology

JCR Abbreviated Title: Endocrinology

ISSN: 0013-7227

Issues/Year: 12

Journal Country/Territory: United States

Language: English

Publisher: Endocrine Soc

Publisher Address: 4350 East West Highway Suite 500, Bethesda, MD 20814-4110

Subject Categories:

Endocrinology & Metabolism: Impact Factor

? Ormandy, C.J., Defazio, A., Kelly, P.A. and Sutherland, R.L. (1992), Transcriptional regulation of prolactin receptor gene expression by sodium butyrate in MCF-7 human breast cancer cells. *Endocrinology*, **131** (2), 982-984.

Abstract: The prolactin receptor (PRLR) mediates the diverse effects of prolactin, which in the mammary gland include the development of lobuloalveolar structures and increased tumor cell proliferation. Treatment of mammary carcinoma cells with the differentiating agent sodium butyrate (NaB) is known to reduce PRLR binding activity and PRLR gene expression, however the mechanism which mediates these changes is unknown, prompting this investigation. Using MCF-7 human breast cancer cells, assay of the rate of PRLR gene transcription by the nuclear run-on technique indicated that 3 mM NaB reduced PRLR gene transcription by 50% after 3 h of treatment and that this effect was maintained for at least 24 h. The protein synthesis inhibitor cycloheximide failed to abrogate this effect, which indicated that NaB did not require continuing protein synthesisto reduce the rate of PRLR transcription. Measurement of PRLR mRNA stability, using Northern blot analysis at various times after the inhibition of transcription with actinomycin D, showed that NaB treatment did not alter PRLR mRNA half-life. These results indicate that NaB inhibits PRLR gene expression by a transcriptional mechanism that does not require continuing protein synthesis.

Keywords: Differentiation-Inducing Agents, Progesterone-Receptor, Estrogen-Receptor, Carcinoma Cells, Messenger-Rnas, Growth, Lines, Hormone, Responsiveness, Stimulation

# Title: Endoscopy

Full Journal Title: Endoscopy

ISO Abbreviated Title: Endoscopy

JCR Abbreviated Title: Endoscopy

ISSN: 0013-726X

Issues/Year: 9

Journal Country/Territory: Germany

Language: Multi-Language

Publisher: Georg Thieme Verlag

Publisher Address: PO Box 30 11 20, D-70451 Stuttgart, Germany

Subject Categories:

Gastroenterology & Hepatology Surgery: Impact Factor

? Freudenberg, S., Hartel, M., Fernandez, F., Schuster, K.L., Kammermaier, V., Haberstroh, J., Schmoll, J., Manegold, B.C. and Hasse, J. (2000), Thermoplastic stents: A new concept for endoluminal prosthesis. *Endoscopy*, **32** (1), 49-53.

Abstract: Background and Study Aims: Intraluminal stenting of organs with stenoses or fistulae in anatomically difficult locations (for instance cardia, pylorus, large bowel), with a tendency to kinking or increased motility, still carries a high risk of stent dislocation. In the search for a solution, we report on the use of a new thermoplastic stent in animal experiments. Material and Methods: The new stent consists of a plastic-coated wire mesh which can be heated electrically. Once it is warmed up to 55 degrees, C., its size and shape can be changed. After being expanded by a dilatation balloon across the stenosed area, the stent can be fitted onto the inner organ surface. This guarantees a low dislocation risk and high stability. In an animal experiment, stents were endoscopically placed in the trachea and the surgically stenosed esophagus of two dogs. The animals were observed for 3 months. Results: The thermostents were implanted easily and without complications. It was possible to mold the thermostent evenly onto the intraluminal wall. No stent dislocation, bleeding or perforation was observed. Upon histologic evaluation, granulation tissue was found to be growing through the wire mesh of the stent. Conclusion: It was shown that the stent described here can be implanted without major problems. The greater effort of the implantation procedure, in comparison with self-expanding stents, is compensated by the special mechanical characteristics of the stent. These characteristics may permit implantation in anatomically difficult locations where up to now stenting has been impossible or inadequate.

Keywords: Upper Gastrointestinal-Tract, Esophageal Cancer, Metal Stents, Palliation, Obstruction

? Bai, Y., Xu, C., Yang, X., Gao, J., Zou, D.W. and Li, Z.S. (2009), Glyceryl trinitrate for prevention of pancreatitis after endoscopic retrograde cholangiopancreatography: a meta-analysis of randomized, double-blind, placebo-controlled trials. *Endoscopy*, **41** (8), 690-695.

Abstract: Background and study alms: Although trials evaluating the preventive effect of glyceryl trinitrate (GTN; nitroglycerin) on pancreatitis occurring after endoscopic retrograde cholangiopancreatography (ERCP) have been reported, there is no agreement as to whether prophylactic GTN treatment can in fact reduce the incidence of post-ERCP pancreatitis. We performed a meta-analysis to compare the effects of prophylactic GTN with placebo on post-ERCP pancreatitis. Study design: Databases including PubMed, EM-BASE, the Cochrane Library, and the Science Citation Index were searched to find relevant randomized controlled trials (RCTs). Two reviewers independently identified relevant trials evaluating the prophylactic effect of GTN on the occurrence of post-ERCP pancreatitis. The outcome measure was the incidence of post-ERCP pancreatitis. Results: Eight trials involving 1920 patients were analyzed. Meta-analysis showed that the incidence of post-ERCP pancreatitis was significantly reduced by GTN treatment (GTN group 5.9%, placebo group 9.8%, P = 0.002), with a relative risk of 0.61 (95% confidence interval 0.44-0.84). Patients who received GTN were 39% less likely to develop pancreatitis. Subgroup analyses suggested that GTN administered by the sublingual or transdermal route may be useful. Conclusions: Prophylactic GTN is useful for prevention of post-ERCP pancreatitis, but the optimal dosage and the optimal route and timing of administration need further clarification before this treatment can come into routine clinical use.

Keywords: Bias, Bile-Duct Stones, Citation, Clinical-Trials, Complications, ERCP, Meta-Analysis, ODDI, Post-ERCP Pancreatitis, Prospective Multicenter, Risk-Factors, Science, Sphincter, Therapeutic ERCP

# Title: Energy

Full Journal Title: [Energy](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5710&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=d94f640cc74550b2dfb16a08e41ade85)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Kostoff, R.N., Tshiteya, R., Pfeil, K.M., Humenik, J.A. and Karypis, G. (2005), Power source roadmaps using bibliometrics and database tomography. *Energy*, **30** (5), 709-730.

Full Text: [E\Energy30, 709.pdf](E/Energy30,%20709.pdf)

Abstract: Database Tomography (DT) is a textual database analysis system consisting of two major components: (1) algorithms for extracting multi-word phrase frequencies and phrase proximities (physical closeness of the multi-word technical phrases) from any type of large textual database, to augment (2) interpretative capabilities of the expert human analyst. DT was used to derive technical intelligence from a Power Sources database derived from the Science Citation Index. Phrase frequency analysis by the technical domain experts provided the pervasive technical themes of the Power Sources database, and the phrase proximity analysis provided the relationships among the pervasive technical themes. Bibliometric analysis of the Power Sources literature supplemented the DT results with author/journal/institution/country publication and citation data.

? Celiktas, M.S. and Kocar, G. (2010), From potential forecast to foresight of Turkey’s renewable energy with Delphi approach. *Energy*, **35** (5), 1973-1980.

Full Text: [2010\Energy35, 1973.pdf](2010/Energy35,%201973.pdf)

Abstract: A Delphi Survey is a series of questionnaires that allow experts or people with specific knowledge to develop ideas about potential future developments around an issue. The Delphi questionnaires were developed throughout the foresight process in relation to the responses given by participants in bibliometric and SWOT analysis conducted prior to the Delphi survey. In this paper, Turkey’s renewable energy future is evaluated using the Delphi method. A two-round Delphi research study was undertaken to determine and measure the expectations of the sector representatives regarding the foresight of renewable energies. First and second round of Delphi study were carried out by using online surveys. About 382 participants responded in the first round of the Delphi questionnaire yielding a respond rate of 20.1%, whereas 325 participants responded at the second round yielding a respond rate of 84.9%. About 50% of Turkey’s energy demand was foresighted to be met by renewable energies around 2030. The results showed that all types of renewable energies would not only provide economic and environmental benefits but also improve living standards. (C) 2010 Elsevier Ltd. All rights reserved.

Keywords: Bibliometric, Bioenergy Use, Delphi, Economic, Elsevier, Energy, Finland, Forecast, Foresight, Future, Germany, India, Knowledge, Methodology, Options, Prospects, Questionnaire, Questionnaires, R&D, Renewable Energy, Research, Science, Standards, Survey, Technology, Technology Foresight, Technology Foresight

# Title: Energy Conversion

Full Journal Title: Energy Conversion

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Takahash, T. and Iwahara, H. (1971), Ionic conduction in perovskite-type oxide solid solution and its application to solid electrolyte fuel cell. *Energy Conversion*, **11** (3), 105-111.

Full Text: [1960-80\Ene Con11, 105.pdf](1960-80/Ene%20Con11,%20105.pdf)

Abstract: Ionic conduction in perovskite-type oxide solid solutions such as CaTi1−x AlxO3−α, CaTi1−x MgxO3−α, SrTi1−x AlxO3−α, La1−xCaxAl3−α etc. was examined under various conditions to attempt to apply them to the solid electrolyte for high temperature fuel cells operative at 800 − 1000°C.

It was found that some of these oxides were predominantly oxide ion conductors under low partial pressure of oxygen while under high partial pressure of oxygen a mixed conduction accompanied with p-type electronic conduction appeared. Of the metals investigated, CaTi1−x AlxO3−α was the most stable and highest conductive electrolyte, the conductivity of which was almost comparable to that of stabilized zirconia.

The performance of hydrogen-oxygen fuel cells with these oxide electrolyte were examined at 800 – 1000°C. The results suggested that some of the perovskite-type oxides could be used as the stable electrolyte for high temperature fuel cellsl though the anode polarization was sometimes observed. In order to improve the cell performance, attempt was made to apply the solid solution of (CeO2)0·6 (LaO1·5)0·4 to the anode materials, and as a consequence, the anode polarization could be remarkably reduced.

Of the cells studied, the CaTi0·7Al0·3O3−α electrolyte cell showed the most excellent and stable characteristics. the power output of this cell (electrolytw thickness was 0·35 mm) was 75 mW/cm2 with the terminal voltage of 0·75 V. Several kinds of fuels other than hydrogen could also be used in this cell with almost the same performance as in the case of the hydrogen fuel.

Keywords: Solid, Electrolyte Fuel Cell, Pervoskite-Type Oxide Solid Solution, Oxide Ionic Conductor, Ionic Conduction, Ion Transference Number

# Title: Energy Conversion and Management

Full Journal Title: [Energy Conversion and Management](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5708&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=e13a1e549407081fc3bd48d14363dbec)

ISO Abbreviated Title: Energy Conv. Manag.

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ISSN: 0196-8904

Issues/Year: 18

Journal Country/Territory: England

Language: English

Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories: Impact Factor 0.459, / (2001)

Thermodynamics: Impact Factor 0.459, / (2001)

Energy & Fuels: Impact Factor 0.459, / (2001)

Mechanics: Impact Factor 0.459, / (2001)

Physics, Nuclear: Impact Factor 0.459, / (2001)

? Saxena, S.C. and Rao, N.S. (1993), Characteristics of a fluidized-bed incinerator for the combustion of solid-wastes. *Energy Conversion and Management*, **34** (2), 81-97.

Abstract: A laboratory-scale fluidized-bed incinerator has been designed for the efficient combustion and thermal destruction of solid waste materials. The experimental facility consists of a 153 mm dia cylindrical furnace, a propane gas burner, an air supply system, batch and continuous feeders, an off-gas cleanup system, flue-gas analyzer system, and an on-line automated data recording and analysis system. A continuous monitoring of temperature and pressure distributions in the incinerator, and composition of the flue gas is possible. Characteristics of the incinerator have been established. These include measurement of pressure drops across the calming and bed sections as a function of superficial air velocity and temperature, and axial temperature distribution in the test bed. Hydrodynamic characteristics of three inert sand beds of average diameters 641, 1312 and 2165 mum have been investigated by recording the pressure-drop histories in the lower and upper regions of the bed as a function of fluidization number and bed temperature. Several statistical functions such as variance of the pressure-drop data, probability density function, skewness, kurtosis, autocorrelation function and probability density function have been computed, and the same have been related to the fluidization quality of the bed. These investigations suggest the optimum conditions for incineration of waste materials where the gas solid contacting and solids mixing is most favorable, and hence, best results will be obtained for thermal destruction and pollution control.

Keywords: Fluidized Bed, Incinerator, Combustion, Solid Wastes

Demirbaş, A. (2000), Liquefaction of olive husk by supercritical fluid extraction. *Energy Conversion and Management*, **41** (17), 1875-1883.

Full Text: [E\Ene Con Man41, 1875.pdf](E/Ene%20Con%20Man41,%201875.pdf)

Abstract: Olive husk was converted to liquid products by using some organic solvents, such as methanol, ethanol and acetone. Supercritical fluid extraction (SCFE) is suitable for the olive husk material. The most effective solvents are acetone for non- catalytic SCFE and methanol for NaOH catalytic SCFE of the olive husk samples. The yields of SCFEs with methanol, ethanol dr acetone were 27.4, 41.5 and 43.2% at 523 K, 40.8, 50.9 and 56.6% at 563 K, and 44.3, 55.1 and 63.0% at 583 K, respectively. The methanol solubles increased from 27.4 to 49.1% (at 523 K), 40.8 to 69.2% (at 563 K) and 44.3 to 84.4% (at 583 K) with 10.0% NaOH catalyst. The catalyst appeared to have a positive effect on the percentage yields in the catalytic methanol runs. Polar components are much more than the non-polar components in the SCFE extracts. On the contrary, non-polar components are much more than the polar components in the catalytic runs. Thus, it has been expressed that some reduction reactions, as well as some cracking reactions, might have occurred during the catalytic SCFEs. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Acetone Extraction, Acids, Catalytic Supercritical Fluid Extraction, Extraction, Fatty, Kinetics, Liquefaction, Methanol, Oil Products, Olive Husk, Pyrolysis, Pyrolysis, Shell, Supercritical Fluid Extraction, Wood, Yields

Yavuz, R. and Küçükbayrak, S. (2001), Adsorption of an anionic dispersant on lignite. *Energy Conversion and Management*, **42** (18), 2129-2137.

Full Text: [E\Ene Con Man42, 2129.pdf](E/Ene%20Con%20Man42,%202129.pdf)

Abstract: Since coal is not a homogeneous substance but a mixture of carbonaceous materials and mineral matter, it has a variety of surface properties. Therefore, it is not easy to control the properties of coal suspensions by simply adjusting variables, such as pH and/or electrolyte. A chemical agent needs to be added to control the properties of the coal suspensions. The aim of this investigation is to determine the adsorption behavior of an anionic dispersant in the presence of a wetting agent using some Turkish lignite samples. The presence of a wetting agent in the dispersant adsorption behavior is important, since usage of a wetting agent in the preparation of coal–water slurries which are acceptable for potential industrial users is of great importance. The effects of dispersant concentration, temperature and pH on the dispersant adsorption were studied systematically, and the experimental results are presented. Pellupur B69 as a dispersant, commercial mixture of formaldehyde condensate sodium salt of naphthalene sulphonic acid, and Texapon N25 as a wetting agent, a sodium lauryl ether sulfate, have been used.

Keywords: Lignite–Water Slurry, Anionic Dispersant Adsorption, Coal–Water Slurry

Karatepe, N. (2003), Adsorption of a non-ionic dispersant on lignite particle surfaces. *Energy Conversion and Management*, **44** (8), 1275-1284.

Full Text: [E\Ene Con Man44, 1275.pdf](E/Ene%20Con%20Man44,%201275.pdf)

Abstract: The concentration and viscosity of the slurry are related to each other, and they have a unique importance in the case of industrial application of the slurry. It is well known that the fluidity of a coal-water slurry with a high coal concentration is largely affected by the nature of the dispersing agent. Therefore, there are good reasons for seeking an understanding of the adsorption behavior of the dispersants on the coal particle surfaces. The aim of this investigation is to determine the adsorption behavior of a non-ionic dispersant, polyoxyethlene sorbitan monooleate, on Turkish lignite samples. The effects of the dispersant concentration, temperature, time and pH on dispersant adsorption were investigated systematically. The results are also analyzed by a two level factorial design matrix to explain the effects of the parameters on the adsorption, and multilinear mathematical models representing the adsorption behavior of the dispersant used within the experimental conditions are proposed for each coal sample used. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Dispersant, Non-Ionic Dispersant Adsorption, Lignite, Lignite-Water Slurry, Coal-Water Suspensions, Rheology, Size

Karaca, S., Gürses, A. and Bayrak, R. (2004), Effect of some pre-treatments on the adsorption of Methylene blue by Balkaya lignite. *Energy Conversion and Management*, **45** (11-12), 1693-1704.

Full Text: [E\Ene Con Man45, 1693.pdf](E/Ene%20Con%20Man45,%201693.pdf)

Abstract: In this study, the effects of some pre-treatments, such as HCl treatment, demineralization and pyrolysis, under a CO2 atmosphere at different temperatures on the adsorption of Methylene blue by Balkaya lignite were investigated. The adsorption capacities of the samples were determined before and after these pre-treatments. In addition, the removals of pyritic and organic sulfur and ash contents for the same coal samples were also defined. It was found that the adsorption capacities of the samples decreased after these pre-treatments. The decrease in adsorption capacity with pyrolysis can be attributed to the changes in surface morphology and/or pore size distribution of the coal samples. On the other hand, the observed decrease in adsorption capacity with removal of carbonates and silicates shows that these minerals have an important effect on Methylene blue adsorption, and the adsorption considerably occurs through electrostatic interactions. In addition, the obtained results showed that the organic sulfur presence in the coal matrix have a positive effect on the Methylene blue adsorption.

Keywords: Author Keywords, Adsorption, Demineralization, Pyrolysis, HCl Treatment, Lignite

Karaca, S., Gürses, A. and Bayrak, R. (2005), Investigation of applicability of the various adsorption models of Methylene blue adsorption onto lignite/water interface. *Energy Conversion and Management*, **46** (1), 33-46.

Full Text: [E\Ene Con Man46, 33.pdf](E/Ene%20Con%20Man46,%2033.pdf)

Abstract: Methylene blue adsorption isotherms for raw and pyrolysed coal samples were determined at 20 °C. The raw coal sample showed the highest adsorption capacity. It was observed that adsorption capacity generally decreased with increasing pyrolysis temperature. The sample pyrolysed at 700 °C exhibited the lowest adsorption capacity. The experimental data obtained were applied to the Freundlich, Langmuir, BET, Halsey, Harkins-Jura, Smith and Henderson isotherm equations to test the fitness of these equations to raw and pyrolysed coal samples. By considering the experimental results and adsorption models applied in this study, it can be concluded that adsorption of Methylene blue occurs through physical interactions, and the lignite sample has a mesoporous structure.

Keywords: Adsorption Isotherms, Lignite, Pyrolysis, Functional Groups, Cationic Dye

# Title: Energy Education Science and Technology Part A-Energy Science and Research

Full Journal Title: [Energy Education Science and Technology Part A-Energy Science and Research](http://silascience.com/eest_part_a.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Yenikaya, C., Yaman, H., Atar, N., Erdogan, Y. and Colak, F. (2009), Biomass resources and decolorization of acidic dyes from aqueous solutions by biomass biosorption. *Energy Education Science and Technology Part A-Energy Science and Research*, **24** (1), 1-13.

Full Text: Ene Edu Sci Tec Par A-Ene Sci Res24, 1.pdf

Abstract: Biofuels can be classified based on their production technologies: First generation biofuels; second generation biofuels; third generation biofuels; and fourth generation biofuels. Biosorption studies of Acid Blue 225 (AB 225) and Acid Blue 062 (AB 062) from aqueous solution onto Bacillus sp were carried out in a batch system. A series of biosorption experiments were undertaken with respect to the initial dye concentration, initial solution pH, biosorbent dosage and contact time. Langmuir isotherm was found to be an optimum isotherm for two dyes. The maximum adsorption capacity for AB 225 and AB 062 were found to be 89.92 mg g-1 and 74.51 mg g-1, respectively, at optimum conditions of pH (1.0) and temperature (25ºC). Equilibrium was reached in 90 min for two dyes. The effect of temperature on the biosorption efficiency was also carried out and the kinetic parameters were determined. The biosorption rates were found to follow the pseudo-second order model. The zeta potential of biomass was also investigated. The present study showed that the Bacillus sp biomass can be used as a suitable biosorbent for the removal of AB 225 and AB 062 from aqueous solution.

Keywords: Acid Blue, Adsorption, Adsorption Capacity, Aqueous Solution, Aqueous Solutions, Bacillus, Bacillus Sp, Basic Dye, Batch, Batch System, Biofuel, Biofuels, Biomass, Biosorbent, Biosorption, Capacity, Concentration, Contact Time, Decolorization, Dye, Dyes, Efficiency, Equilibrium, Experiments, Fermentation, Generation, Isotherm, Kinetic, Kinetic Parameters, Kinetics, Langmuir, Langmuir Isotherm, Macerans, Model, pH, Potential, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second Order Rate, Pseudo-Second-Order, Rates, Removal, Residues, Solution, Solutions, Technologies, Temperature, Waste, Zeta Potential

? Konur, O. (2012), Prof. Dr. Ayhan Demirbas’ scientometric biography. *Energy Education Science and Technology Part A-Energy Science and Research*, **28** (2), 727-738.

Full Text: 2012Ene Edu Sci Tec Par A-Ene Sci Res28, 727.pdf

Abstract: It is well established fact that Turkish scientists have increasingly contributed to the literature on the bio-energy in recent years. However, there has not been any biographic study of these scientists as well as scientists working in the field of bio-energy. Therefore, as a first-ever case study of Turkish scientists, this paper presents a scientometric biography of Prof. Dr. Ayhan Demirbas working in the area of bio-energy since 1980s. He produced 454 articles and reviews in the interdisciplinary areas relating to the bio-energy between 1984 and 2010 where 379 of them were indexed by the SCI or the SSCI. He received 7,309 citations for his 454 papers giving a ratio for the “Average Citations per Item” as 16.1 and “H-index” over 39 as of July 2011, suggesting that the scientific impact of his research on the relevant literature has been significant. This paper suggests that scientometric methods are useful for the evaluation of individual researchers and for publicizing their scientific achievement.

Keywords: Achievement, Bio-Energy, Biodiesel Fuels, Biofuels, Biomass Fuels, Citation Analysis, Citations, Energy-Sources, Evaluation, Future, Impact, Literature, Papers, Prof. Dr. Ayhan Demirbas, Ratio, Recent Trends, Research, Research Evaluation, Research Productivity, Researchers, SCI, Scientific Impact, Scientometric Biography, SSCI, Supercritical Methanol, Transesterification, Vegetable-Oils

? Konur, O. (2012), The evaluation of the research on the biofuels: A scientometric approach. *Energy Education Science and Technology Part A-Energy Science and Research*, **28** (2), 903-916.

Full Text: 2012\Ene Edu Sci Tec Par A-Ene Sci Res28, 903.pdf

Abstract: The present study explores the characteristics of the literature on the biofuels published during the last three decades, based on the databases of Science Citation Index Expanded (SCIE) and Social Sciences Citation Index (SSCI) and its implications using the scientometric techniques. The results of this study reveal that the literature on the biofuels has grown exponentially during this period reaching 6,770 papers in total with paralleling enormous changes in the research landscape. Papers mostly have been journal articles, reviews, and proceedings, predominantly in English. USA, China, and Germany have been the three most prolific countries. The “University of Illinois” has been the most prolific institution. The most prolific authors have been “Demirbas A” and “Minter SD”. “Biomass & Bioenergy” has been the most prolific journal whilst, “Energy Fuels” has been the most prolific subject area. The total number of citations is 79,304, giving a ratio for the “Average Citations per Item” as 11.71 and “H-index” as 101. Ragauskas et al. has had the highest impact on the literature. Both the research output and the citations have thrived spectacularly after 2005. The results of this first ever such study of its kind, show that the scientometric analysis has a great potential to gain valuable insights into the evolution of the high-profile research on the biofuels, complementing other research techniques.

Keywords: Analysis, Authors, Biodiesel Production, Biofuels, Biomass, Chemicals, China, Citation, Citations, Databases, Energy, English, Ethanol, Evaluation, Evolution, Germany, Hydrolysis, Impact, Journal, Literature, Microalgae, Microbial Fuel-Cells, Papers, Ratio, Recent Trends, Research, Research Evaluation, Research Output, Science, Science Citation Index, Sciences, Scientometric Analysis, Scientometric Techniques, Scientometrics, Social Sciences, Social Sciences Citation Index, SSCI, USA, Web of Knowledge

? Konur, O. (2012), The evaluation of the research on the biodiesel: A scientometric approach. *Energy Education Science and Technology Part A-Energy Science and Research*, **28** (2), 1003-1014.

Full Text: 2012\Ene Edu Sci Tec Par A-Ene Sci Res28, 1003.pdf

Abstract: The present study explores the characteristics of the literature on the biodiesel published during the last three decades based on the Science Citation Index Expanded (SCIE) and Social Sciences Citation Index (SSCI) and its implications using the scientometric techniques. The results of this study reveal that the research output on the biodiesel and the citations received have grown exponentially during this period especially after 2004 with paralleling enormous changes in the research landscape. The US, China, and Brazil have been the three most prolific countries. The “USDA” has been the most prolific institution and “Demirbas A” of Turkey has been the most prolific author. “Bioresource Technology” has been the most prolific journal whilst, “Energy & Fuels” has been the most prolific subject area. “H-index” was 102 and Ma & Hanna [1] has had the highest impact on the literature. The scientometric analysis has a great potential to gain valuable insights into the evolution of the research on the biodiesel, complementing the scientometric studies in the other fields of the renewable energies such as biohydrogen, bioenergy, biofuels, and microbial fuel cells, providing a unique insight on the incentive structures for all the key stakeholders in the field.

Keywords: Analysis, Animal Tallow, Author, Biodiesel, Biofuels, Brazil, Canola Oil, China, Citation, Citations, Diesel-Engine, Emissions, Evaluation, Evolution, Fuels, Hydrogen Energy, Impact, Insight, Journal, Literature, Oil Methyl-Ester, Performance, Renewable Fuels, Research, Research Evaluation, Research Output, Science, Science Citation Index, Sciences, Scientometric Analysis, Scientometric Techniques, Scientometrics, Social Sciences, Social Sciences Citation Index, SSCI, Turkey, US, Web of Knowledge

? Konur, O. (2012), The evaluation of the research on the bioethanol: A scientometric approach. *Energy Education Science and Technology Part A-Energy Science and Research*, **28** (2), 1051-1064.

Full Text: 2012\Ene Edu Sci Tec Par A-Ene Sci Res28, 1051.pdf

Abstract: The present study explores the characteristics of the literature on the bioethanol published during the last three decades based on the Science Citation Index Expanded (SCIE) and Social Sciences Citation Index (SSCI) and its implications using the scientometric techniques. The results of this study reveal that the research output on the bioethanol and the citations received have grown exponentially during this period especially after 2004 with paralleling enormous changes in the research landscape. The US, China, and Japan have been the three most prolific countries. The “Tech Univ Denmark” has been the most prolific institution and “Zacchi G” of Sweden has been the most prolific author. “Bioresource Technology” has been the most prolific journal whilst “Biotechnology & Applied Microbiology” has been the most prolific subject area. “H-index” was 61 and “Demirbas A” [1] has had the highest impact on the literature. The scientometric analysis has a great potential to gain valuable insights into the evolution of the research on the bioethanol, complementing the scientometric studies in the other fields of the renewable energies such as biohydrogen, biodiesel, bioenergy, biofuels, and microbial fuel cells, providing a unique insight on the incentive structures for all the key stakeholders in the field.

Keywords: Analysis, Author, Bio-Ethanol, Biodiesel Production, Bioethanol, Biofuels, China, Citation, Citations, Diesel-Engine, Emissions, Energy, Evaluation, Evolution, Fuel Ethanol-Production, Hydrogen-Production, Impact, Insight, Japan, Journal, Literature, Oil, Renewable Fuels, Research, Research Evaluation, Research Output, Science, Science Citation Index, Sciences, Scientometric Analysis, Scientometric Techniques, Scientometrics, Social Sciences, Social Sciences Citation Index, SSCI, US, Web of Knowledge

# Title: Energy Engineering

Full Journal Title: Energy Engineering

ISO Abbreviated Title: Energy Eng.

JCR Abbreviated Title: Energ Eng

ISSN: 0199-8595

Issues/Year: 6

Journal Country/Territory: United States

Language: English

Publisher: Energy Engineering

Publisher Address: 700 Indian Trail, Lilburn, GA 30047

Subject Categories:

Energy & Fuels: Impact Factor 0.036, / (2000)

Al-Duri, B. and McKay, G. (1988), Criteria for selecting devices for waste heat recovery. *Energy Engineering*, **85**, 53-64.

# Title: Energy & Environmental Science

Full Journal Title: Energy & Environmental Science

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Krebs, F.C., Nielsen, T.D., Fyenbo, J., Wadstrøm, M. and Pedersen, M.S. (2010), Manufacture, integration and demonstration of polymer solar cells in a lamp for the “Lighting Africa” initiative. *Energy & Environmental Science*, **3** (5), 512-525.

Full Text: [2010\Ene Env Sci3, 512.pdf](2010/Ene%20Env%20Sci3,%20512.pdf)

Abstract: Semitransparent flexible polymer solar cells were manufactured in a full roll-to-roll process under ambient conditions. After encapsulation a silver based circuit was printed onto the back side of the polymer solar cell module followed by sheeting and application of discrete components and vias. The discrete components were white light LEDs, a blocking diode, a lithium ion battery, vias and button contacts in two adjacent corners. The completed lamp has outside dimensions of 22.5 x 30.5 cm, a weight of 50 g and a very flat outline. The battery and components were the thickest elements and measured < 1 mm. A hole with a ring was punched in one corner to enable mechanical fixation or tying. The lamp has two states. In the charging state it has a completely flat outline and will charge the battery when illuminated from either side while the front side illumination is preferable. When used as a lamp two adjacent corners are joined via button contacts whereby the device can stand on a horizontal surface and the circuit is closed such that the battery discharges through the LEDs that illuminate the surface in front of the lamp. Several different lamps were prepared using the same solar cell and circuitry while varying the amount of white LEDs employed and by variation of the number of batteries and the individual battery capacity. The lamp prototype was developed through two early prototypes and the final and serially produced prototype was subjected to field tests in Zambia. Some of the lamps were recovered and the experiences gained with the prototype are presented allowing for further development that takes systemic factors such as the immediate response and spontaneous handling of the lamp by someone with no prior knowledge of the lamp or its workings.

# Title: Energy & Fuels

Full Journal Title: [Energy & Fuels](http://pubs.acs.org/journals/enfuem/index.html)

ISO Abbreviated Title: Energy Fuels

JCR Abbreviated Title: Energ Fuel

ISSN: 0887-0624

Issues/Year: 6

Journal Country/Territory: United States

Language: English

Publisher: Amer Chemical Soc

Publisher Address: 1155 16th St, NW, Washington, DC 20036

Subject Categories:

Energy & Fuels: Impact Factor

Engineering, Chemical: Impact Factor 1.011, 19/110 (1999), Impact Factor 1.094, 14/110 (2000), Impact Factor 1.198, 15/126 (2002)

Saxena, S.C., Tanjore, V.N. and Rao, N.S. (1992), Basic hydrodynamic characteristics of a fluidized-bed incinerator. *Energy & Fuels*, **6** (4), 502-511.

Full Text: [E\Ene Fue6, 502.pdf](E/Ene%20Fue6,%20502.pdf)

? Ali, L. and Barrufet, M.A. (1994), Profile modification due to polymer adsorption in reservoir rocks. *Energy & Fuels*, **8** (6), 1217-1222.

Full Text: [1994\Ene Fue8, 1217.pdf](1994/Ene%20Fue8,%201217.pdf)

Abstract: Flow behavior of a newly developed starch-based biopolymer is studied in the laboratory to gain insight into its ability and effectiveness to recover additional oil. This study analyzes permeability modification due to polymer adsorption in the porous media. Experiments are performed to determine the permeability reduction and the effects of polymer adsorption on capillary pressure curves. A model is developed to estimate the amount of polymer adsorbed in the porous media. The difference in pore size distribution before and after polymer flow indicates the effectiveness of polymer to modify the permeability profile. The difference in capillary pressure curves before and after polymer flow indicates the extent of polymer adsorption in the porous media. It is observed in this study that permeability reduction is a function of both initial permeability and polymer concentration. This study shows that starch-based biopolymers are not only cost effective and environmentally safe but also are very effective for profile modification. Therefore, these polymers can be used to recover additional oil where channeling and bypassing of oil by water are the main problems.

Keywords: Adsorption, Behavior, Biopolymers, Concentration, Cost, Distribution, Effectiveness, Flow, Model, Modification, Oil, Permeability, Polymer, Polymers, Pore Size, Pore Size Distribution, Porous, Porous Media, Pressure, Profile, Reduction, Size Distribution, Water

? Haghseresht, F. and Lu, G.Q. (1998), Adsorption characteristics of phenolic compounds onto coal-reject-derived adsorbents. *Energy & Fuels*, **12** (6), 1100-1107.

Full Text: [1998\Ene Fue12, 1100.pdf](1998/Ene%20Fue12,%201100.pdf)

Abstract: Carbonaceous adsorbents were prepared by heat treatment of coal reject at 600°C, after chemical treatment in HNO3, H2SO4, and NaOH at 25 and 75°C. Pore structure characterization and the phenol adsorption capacities of the adsorbents showed that nitric acid pretreatment significantly enhanced the surface properties, consequently the adsorption capacities of the adsorbents. A number of samples were subsequently prepared by carbonizing coal reject at 600°C, after pretreatment in HNO3 under various conditions. The acid concentration, residence time, and reaction temperature were varied to obtain adsorbents with various pore structures. The adsorption capacities of the derived adsorbents for phenol, p-nitrophenol, and benzene were measured to gain further insights into the pore structure evolution. Adsorption isotherms of phenol, p-nitrophenol, and p-chlorophenol on the best adsorbent prepared were determined and correlated with theoretical isotherm equations, such as the Langmuir, Freundlich, and Redlich-Peterson equations.

Keywords: Activated Carbons, Bituminous Coal, Sorption

Bhaskar, T., Matsui, T., Nitta, K., Uddin, M.A., Muto, A.K. and Sakata, Y. (2002), Laboratory evaluation of calcium-, iron-, and potassium-based carbon composite sorbents for capture of hydrogen chloride gas. *Energy & Fuels*, **16** (6), 1533-1539.

Full Text: [E\Ene Fue16, 1533.pdf](E/Ene%20Fue16,%201533.pdf)

Abstract: The pyrolysis of PVC containing waste plastics produce hydrogen chloride (HCl) in addition to valuable chemical feedstock. The removal of HCl from the process is essential, as it is corrosive and produces halogenated hydrocarbons in liquid products, which cannot be used as fuel. A laboratory scale experimental study on sorption of hydrogen chloride was carried out using fixed bed microreactor at atmospheric pressure. Calcium (Ca-C), iron (Fe-C), and potassium (K2CO3-C) based carbon composite sorbents were developed and used in the present investigation, optimum sorption reaction conditions for the maximum utilization of sorbent capacity were determined. The results suggest that the calcium carbonate carbon composite sorbent (Ca-C) reacted with hydrogen chloride gas leaving no residual HCl gas for 12 h (breakthrough point). Approximately 63% of theoretical sorbent capacity was observed under the following optimized reaction conditions: linear gas velocity, 0.18 m/s, inlet HCl concentration, 1820 ppm, weight of sorbent, 2 g, particle size, 0.25 mm, and total gas flow: 535 mL/min. A sorption temperature of 350 degreesC was found to be optimum for the effective reaction of hydrogen chloride with sorbent. The effect of particle size, total gas flow, inlet hydrogen chloride concentration, and effect of temperature on the adsorption capacity of Ca-C sorbent was studied.

Keywords: Dechlorination, Temperature, Combustion, Emissions, Injection, Sorption, Plastics, Waste, PVC

Acevedo, S., Ranaudo, M.A., Garcia, C., Castillo, J. and Fernandez, A. (2003), Adsorption of asphaltenes at the toluene-silica interface: A kinetic study. *Energy & Fuels*, **17** (2), 257-261.

Full Text: [E\Ene Fue17, 257.pdf](E/Ene%20Fue17,%20257.pdf)

Abstract: The adsorption kinetics of asphaltenes at the toluene-silica interface has been measured for nine solution concentrations C-S (from 5 to 3000 mgL-1) Results could be adjusted to an irreversible second-order adsorption kinetics, where the adsorption rate k was strongly dependent on concentration. Thus a large reduction in k was observed when C-S was increased in the studied concentration range. This rate reduction was accounted for in terms of adsorption of aggregates formed in solution. The step-wise trends observed for the adsorption isotherms of asphaltenes on mineral surfaces, could be reproduced using the above k values.

Keywords: Aggregate Formation, Crude-Oil, Nitrophenol, Surfaces

? Ahmaruzzaman, M. (2009), Role of fly ash in the removal of organic pollutants from wastewater. *Energy & Fuels*, **23** (3), 1494-1511.

Full Text: [2009\Ene Fue23, 1494.pdf](2009/Ene%20Fue23,%201494.pdf)

Abstract: Fly ash, a relatively abundant and inexpensive material, is currently being investigated as an adsorbent for the removal of various organic pollutants from wastewater. The wastewater contains various types of phenolic compounds, such as chloro, nitro, amino, and other substituted compounds. Various types of pesticides, such as lindane, malathion, carbofuran, etc., and dyes, such as, methylene blue, crystal violet, malachite green, etc., are also present in the wastewater. These contaminants pollute the water stream. These organic pollutants, such as phenolic compounds, pesticides, and dyes, etc., can be removed very effectively using fly ash as adsorbent. This article presents a detailed review on the role of fly ash in the removal of organic pollutants from wastewater. Adsorption of various pollutants using fly ash has been reviewed. The adsorption mechanism and other influencing factors, favorable conditions, and competitive ions, etc., on the adsorption process have also been discussed in this paper. It is evident from the review that fly ash has demonstrated good removal capabilities for various organic compounds.

Keywords: Activated Carbon, Adsorption, Aqueous-Solution, Basic Dye Adsorption, Congo-Red, Equilibrium Isotherm Analyses, Fired Power-Stations, Low-Cost Adsorbents, Malachite Green, Polycyclic Aromatic-Hydrocarbons, Solute Adsorption-Isotherm, Sugar-Industry Waste, Wastewater

? Sharma, Y.C., Uma and Upadhyay, S.N. (2009), Removal of a cationic dye from wastewaters by adsorption on activated carbon developed from coconut coir. *Energy & Fuels*, **23** (6), 2983-2988.

Full Text: [2009\Ene Fue23, 2983.pdf](2009/Ene%20Fue23,%202983.pdf)

Abstract: Biosorption of a cationic dye, methylene blue (MB) onto coconut coir activated carbon (CCAC) developed by thermal activation has been investigated. Coconut coir is a byproduct of Coconut based industries. The unusable part of the coconut coir was used to develop activated carbon. The effect of contact time and temperature on the removal of dye was studied. The process of dye removal followed a first-order kinetics, and the value of the rate constant of adsorption was found to be 1.15×10-2 min-1 under optimum conditions. Adsorption data was fitted to Langmuir, Freundlich, Temkin, and Dubinin-Radushkevich adsorption isotherm equations. The thermodynamic studies for the process of removal of dye were carried out, and the parameters, namely, free energy (Δ*G*0), enthalpy (Δ*H*0), and entropy (Δ*S*0) changes, were determined. The removal increased from 74.20 to 93.58% with decrease in concentration of dye from 100 to 60 mg/L at 30°C, 150 rpm, and pH 5.3. The removal exhibited an increasing trend with increasing temperature, exhibiting the endothermic nature of the removal process.

Keywords: Activated Carbon, Activation, Adsorbent, Adsorption, Adsorption Isotherm, Agricultural Waste, Aqueous-Solutions, Bagasse Pith, Biosorption, Carbon, Cationic Dye, Changes, Color Removal, Concentration, Data, Dye, Dye Removal, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, First Order, First-Order Kinetics, Fly-Ash, Freundlich, Isotherm, Isotherm Equations, Kinetics, Langmuir, MB, Methylene Blue, pH, Rate Constant, Removal, Single, Sorption, Temperature, Thermal Activation, Thermodynamic, Thermodynamic Studies, Trend, Value, Waste-Water

? Nassar, N.N. (2010), Asphaltene adsorption onto alumina nanoparticles: Kinetics and thermodynamic studies. *Energy & Fuels*, **24** (8), 4116-4122.

Full Text: [2010\Ene Fue24, 4116.pdf](2010/Ene%20Fue24,%204116.pdf)

Abstract: Asphaltene adsorption onto nanoparticles is an attractive subject for the heavy oil industry for two important reasons. First, nanoparticles would remove asphaltenes from the heavy oil rapidly and thus making the remaining fraction of oil transportable for conventional processing. Second, nanoparticles could be employed as catalysts for upgrading asphaltenes into light usable distillates. The first part has been investigated in this study, while the second part will be communicated shortly. In this study, the adsorption of asphaltenes from heavy oil model solutions onto colloidal nanoparticles of gamma-Al2O3 is investigated. Batch adsorption experiments were carried out at different initial asphaltene concentrations and temperatures. The effects of the following variables on the amount of asphaltene adsorbed have been investigated, namely, contact time, initial concentration of asphaltenes, temperature, heptane/toluene ratio (H/T), coexisting molecules, and water content. Asphaltene adsorption kinetics and isotherms were obtained. The adsorption was fast, and equilibrium was approached within 2 h. The pseudo-first-order and pseudo-second-order kinetic models were applied to the experimental data, with a better fitting to the pseudo-second-order model. The resultant isotherms are in good agreement with the Langmuir isotherm model. The thermodynamics of asphaltene adsorption onto the gamma-Al2O3 nanoparticles indicated that the adsorption was spontaneous and exothermic in nature.

Keywords: Adsorbed Asphaltenes, Adsorption, Adsorption Kinetics, Adsorption Kinetics and Isotherms, Aggregation, Alumina, Batch Adsorption, Concentration, Conventional, Crude-Oil-Emulsions, Data, Equilibrium, Exothermic, Experimental, Experiments, First, Gamma-Al2O3, Isotherm, Isotherm Model, Isotherms, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Mineral Surfaces, Model, Models, Nanoparticles, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Reservoir Rocks, Solutions, Spectroscopy, Stability, Temperature, Thermodynamic, Thermodynamics, Toluene, Viscosity, Water, Wettability

# Title: Energy Policy

Full Journal Title: [Energy Policy](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=03014215)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Uzun, A. (2002), National patterns of research output and priorities in renewable energy. *Energy Policy*, **30** (2), 131-136.

Full Text: [E\Ene Pol30, 131.pdf](E/Ene%20Pol30,%20131.pdf)

Abstract: This paper attempts to compare the research output and priorities of 25 major countries in renewable energy research. The main objective is to assess the research priorities of the major countries in frontier areas/subjects of renewable energy using some bibliometric measures based on renewable energy literature. Subjects of high activity and subjects of low activity are identified for two time periods (1996–1997 and 1998–1999). Our findings show that the output of publications including articles, reviews, letters, notes, editorials, and book reviews of India, Greece, and Belgium declined between 1996–1997 and 1998–1999. All measures indicate that in the USA all subjects of renewable energy received more or less the same priority. The rest of the countries had differentiated high- or low-priority profiles in different subjects. Among the main research subjects of renewable energy only photovoltaic technology (PV) had a fairly homogenous profile for all countries.

Keywords: Renewable Energy, Research Output, Research Priority

# Title: Energy Sources

Full Journal Title: Energy Sources-Journal of Extraction Conversion and the Environment

Full Journal Title: [Energy Sources](http://www.swetswise.com/eAccess/titleDetail.do?titleID=67689), [Energy Sources](http://weblinks1.epnet.com/authhjafdetail.asp?tb=1&_ua=bt+%22Energy++Sources%22+shn+1+db+aphjnh+bo+B%5FJN+7B0D&_ug=sid+7F06AD4E%2D0895%2D4145%2D9FCF%2D1F087DF358AC%40sessionmgr2+dbs+aph+E972&_us=or+Date+ss+SO+sm+KS+sl+%2D1+ri+KAAACBZD00097506+dstb)

ISO Abbreviated Title: Energy Sources

JCR Abbreviated Title: Energ Source

ISSN: 0090-8312

Issues/Year: 10

Journal Country/Territory: United States

Language: English

Publisher: Taylor & Francis Inc

Publisher Address: 325 Chestnut St, Suite 800, Philadelphia, PA 19106

Subject Categories:

Energy & Fuels: Impact Factor

Engineering, Chemical: Impact Factor 0.338, 70/110

? Khattab, M.A., Hosny, A.Y., Nassar, M.M. and Elgeundi, M. (1993), Thermal studies of some dye-adsorbent materials. *Energy Sources*, **15** (3), 505-512.

Full Text: Ene Sou15, 505

Abstract: Thermal behavior of sawdust, maize cob, and bagasse materials treated with basic dye was investigated using differential thermal analysis (DTA) and thermogravimetric analysis (TGA). The results showed that the thermal decomposition pattern of both treated and untreated material has three peaks. The first peak is endothermic while the second and the third peaks are exothermic. The peak intensities and the corresponding temperatures differ for untreated and treated materials. The effect of treatment (adsorption of basic dye) was more pronounced for sawdust and maize cob than for bagasse. The calorific values of treated sawdust and maize cob are higher than the untreated. These materials are considered new potential source for energy conversion

Keywords: Adsorption, Bagasse, Dye, Endothermic, Energy Conversion, Maize Cob, Sawdust, Thermal Analysis, Thermogravimetric Analysis

Das, A. and Sharma, D.K. (1998), Adsorption of phenol from aqueous solutions by oxidized and solvent-extracted residual coal. *Energy Sources*, **20** (9), 821-830.

Full Text: [E\Ene Sou20, 821.pdf](E/Ene%20Sou20,%20821.pdf)

Abstract: Studies on the adsorption of phenol fi om aqueous solution by using pretreated noncoking low-grade bituminous coal are reported. The coal showed better adsorption after oxidation for more than 6h. Extraction with quinoline and ethylenediamine also showed a remarkable increase in phenol adsorption. However the coupling of oxidation and solvent extraction did not seem to help in improving the adsorption. The particle size of the coal showed no relation to the degree of oxidation, or to the period of adsorption. The solvent-extracted residual coal showed almost 43% adsorption of phenol, which was equivalent to that observed for activated carbon. Adsorption of phenol on low-grade coals or on residual coals obtained after solvent extraction (organosolvo-refining) may upgrade those fuels. Further studies may be required before using the phenol-adsorbed coal/solvent-extracted residual coal as a fuel.

Keywords: Adsorption, Coal, Oxidation, Phenol, Solvent Extraction, Carbon

Lalvani, S.B., Hübner, A. and Wiltowski, T.S. (2000), Chromium adsorption by lignin. *Energy Sources*, **22** (1), 45-56.

Full Text: [E\Ene Sou22, 45.pdf](E/Ene%20Sou22,%2045.pdf)

Abstract: Hexavalent chromium is a known carcinogen, and its maximum contamination level in drinking water is determined by the U.S. Environmental Protection Agency (EPA). Chromium in the wastewaters from plating and metal finishing, tanning, and photographic industries poses environmental problems. A commercially available lignin was used for the removal of hexavalent as well as trivalent chromium from aqueous solution. It is known that hexavalent chromium is present as an anionic species in the solution. It was found that lignin can remove up to 63% hexavalent and 100% trivalent chromium from aqueous solutions. The removal of chromium ions was also investigated using a commercially available activated carbon. This absorbent facilitated very little hexavalent and almost complete trivalent chromium removal. Adsorption isotherms and kinetics data on the metal removal by lignin and activated carbon are presented and discussed.

Keywords: Hexavalent Chromium, Activated Carbon, Removal, Activated Carbon, Adsorption, Chromium, Lignin

Ochoa, J., Bonelli, P.R., Cassanello, M.C. and Cukierman, A.L. (2001), Effect of thermal and acid treatments on properties of Argentinean low rank coals. *Energy Sources*, **23** (4), 383-392.

Full Text: [E\Ene Sou23, 383.pdf](E/Ene%20Sou23,%20383.pdf)

Abstract: The chemical, structural, and textural-morphological features of low rank coals, subbituminous and high volatile bituminous, from Argentinean minefields were examined. Features modifications arising from thermal treatment and mineral matter removal were analyzed and related to chars reacrivity for CO2 gasification. For this purpose, proximate, ultimate, and ash analyses, X-ray diffraction, mercury intrusion porosimetry, adsorption of CO2 (298 K), and scanning electronic microscopy were performed on the original coals as well as on the raw and demineralized char samples. Thermal treatment increased the coals structural ordering and affected pores of any size, leading to bimodal macro-meso-pore size distributions and to a pronounced development of micropores. Disarrangement of the structures took place as a result of mineral matter removal altering mainly macro- and mesopores, thus producing unimodal distributions. Structural changes occasioned by thermal treatment and demineralization were also reflected in modifications of the surface fractal dimensions estimated from mercury porosimetry data. Reactivity of chars for gasification was significantly affected by demineralization not only due to removal of metals, likely responsible for catalytic effects, but also induced by the structural modifications.

Keywords: Coal Char Demineralization, Coal Char Gasification, Coal Char Properties, Reactivity, Gasification, Combustion, Chars

Wasiuddin, N.M., Tango, M. and Islam, M.R. (2002), A novel method for arsenic removal at low concentrations. *Energy Sources*, **24** (11), 1031-1041.

Full Text: [E\Ene Sou24, 1031.pdf](E/Ene%20Sou24,%201031.pdf)

Abstract: The presence of low concentrations of arsenic in water is of serious environmental concern. Though it is a naturally occurring carcinogenic element, it could also be released into the atmosphere through numerous industrial activities. The objective of this paper is to reveal arsenic-adsorptive properties of human hair from contaminated drinking water. Human hair has been found to be extremely effective in separating oil and water from stable oil-water emulsions (recently conducted US DoE study). Both static and dynamic tests, along with numerical modeling, have been performed to observe the performance of human hair as an adsorbent. Static tests show satisfactory performance through high adsorption capacity at low concentrations. Dynamic tests demonstrate the feasibility of the technique in a packed bed column. Numerical modeling was used to conduct various parametric studies and to scale up laboratory data. Finally, a compacted hair pad has been suggested for use in the column, and some prospective future applications have been proposed.

Keywords: Adsorption, Arsenic, Drinking Water, Human Hair, Numerical Modeling, Porous-Media, Adsorption

Mustafiz, S., Basu, A., Islam, M.R., Dewaidar, A. and Chaalal, O. (2002), A novel method for heavy metal removal. *Energy Sources*, **24** (11), 1043-1051.

Full Text: [E\Ene Sou24, 1043.pdf](E/Ene%20Sou24,%201043.pdf)

Abstract: Effective removal of metal ions from industrial wastewater by using fish scales was studied in this article. A series of static tests was performed with 10 g of dried fish scale adsorbent pulverized to micron sizes of 37 or less. Such tests were conducted for lead ions (from lead nitrate solution) at concentrations of 25 ppm, 12.5 ppm, and 6.25 ppm. The dynamic equilibrium results were based on tests on 50 ppm of cobalt chloride solution (flow rate 1 ml/min), followed by 100 ppm of cobalt solution (flow rate 7 ml/min), and then a mixture of cobalt chloride (CoCl2), lead nitrate (Pb(NO3)2), zinc nitrate hexahydrate (Zn(NO3)2.6H2O) and strontium nitrate (Sr(NO3)2) solutions. The proposed sorption technique offers an acceptable solution for removal of heavy metal ions from wastewater streams. The potential application of this study is an enormous energy cost savings in the electroplating industry, which requires the replacement of wastewater and the burial of metal sludge in landfills. Also, the trimming of energy costs in oil drilling and pipeline corrosion is possible by potential formation of biopolymers developed from “adsorbed scale.”

Keywords: Heavy Metals, Fish Scale, Static Test, Dynamic Test, Adsorption, Desorption, Systems

Mahramanlioglu, M. and Güçlü, K. (2003), Removal of MCPA (4-chloro-2-methylphenoxy-acetic acid) from aqueous solutions using adsorbent produced from elutrilithe. *Energy Sources*, **25** (1), 1-13.

Full Text: [E\Ene Sou25, 1.pdf](E/Ene%20Sou25,%201.pdf)

Abstract: Elutrilithe is a mixed alumina-silicate/carbon material and a solid waste of coal mines. In this study we tried to produce a new adsorbent from elutrilithe. The elutrilithe was treated with zinc chloride in an N2 medium. The adsorption capacity of the new adsorbent was measured with MCPA (4-chloro-2-methylphenoxy-acetic acid), which is a pesticide.

The adsorption experiments were carried out as a function of time, initial concentration, agitation rates, and temperature. The Langmuir model was used to fit the equilibrium data. Satisfactorily fitting the data and consistency in parameter values indicated this isotherm could be used for the system. The adsorption kinetic results were interpreted by second-order rate equation, and rate constants were calculated for different agitation rates. The intraparticle rate diffusion constants were calculated for different agitation rates.

Thermodynamic parameters were calculated. The negative values of enthalpy change indicated the exothermic nature of the adsorption process, and the negative values of DeltaG(0) were indicative of the spontaneity of the adsorption process.

Keywords: Elutrilithe, Mining Wastes, Pesticides, MCPA, Adsorption, Waste-Water Treatment, Low-Cost Adsorbent, Activated Carbons, Fly-Ash, Equilibrium Uptake, Sorption Dynamics, Column Operations, Bituminous Coals, Zinc-Chloride, Mass-Transfer

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Full Text: [2004\Ene Sou26, 1357.pdf](2004/Ene%20Sou26,%201357.pdf)

Abstract: Thermal behavior of untreated and treated bagasse-pith with acidic and basic dyes was investigated using differential thermal analysis (DTA) and thermogravimetric thermal analysis (TGA). The results showed that the thermal decomposition pattern can be divided into three peaks. The first peak is endothermic while the second and the third peaks are exothermic. The peak intensities and the corresponding temperatures were different for the untreated acid treated materials. The decomposition thermographs of the reacted acid dye differ than that of basic dye, this is due to the differences in adsorption behavior and differences in the adsorption capacity of each dye toward bagasse. The reaction rate, activation energy, entropy change, enthalpy change and Gibbs free energy for the treated and untreated bagasse-pith were calculated. The calorific values of the treated pith are higher than untreated.

Keywords: Thermal Decomposition, Kinetic, Thermodynamic, Bagasse-Dye, Adsorbent, TGA, DTA, Palm-Fruit Bunch, Removal, Mechanism

? Chaalal, O., Zekri, A.Y. and Islam, R. (2005), Uptake of heavy metals by microorganisms: An experimental approach. *Energy Sources*, **27** (1-2), 87-100.

Full Text: [2005\Ene Sou27, 87.pdf](2005/Ene%20Sou27,%2087.pdf)

Abstract: Contamination in drinking water is the most common form of environmental problems encountered in water resources management. Some contaminants, present accidentally in drinking water, are very difficult to remove, such as heavy elements that are products of industrial waste. Lead is one of the most difficult-to-remove elements. This paper proposes a novel process for removal of lead compounds contaminants from water. The proposed method shows great efficiency.

The technique uses thermophilic bacteria found in the United Arab Emirates near Al-Ain town located in Abu-Dhabi Emirates. These bacteria were isolated and used in a reactor coupled with a membrane system. The bacteria, the stirrer and the membrane housed in the reactor are arranged in a distinctive way to form the novel bio-stabilization process proposed in this research. This proposed technique could be used at low cost and with great confidence in the purification of drinking water. The system was found to be adequate for concentrations of lead in the range of 5-40 ppm. At the end of the operation the lead concentration reaches the level allowed by the World Health Organization regulations.

Keywords: Bioremediation, Lead, Membrane Reactor, Thermophilic Bacteria, Unicellular Green Microalgae, Cadmium

? Moazed, H. and Viraraghavan, T. (2005), Use of organo-clay/anthracite mixture in the separation of oil from oily waters. *Energy Sources*, **27** (1-2), 101-112.

Full Text: [2005\Ene Sou27, 101.pdf](2005/Ene%20Sou27,%20101.pdf)

Abstract: Bentonite organo-clay/anthracite mixture containing 30% granular organo-clay and 70% anthracite was used in this study to assess its potential for removal of oil from synthetic and actual oil-in-water emulsions. Batch kinetic studies showed that equilibrium time was reached within 2 to 4 hours of contact time. Data obtained from kinetic studies indicated good fit for both the Lagergren’s and Ho’s nonlinear models. Batch isotherm studies showed that the sorption of various oils by the mixture can well be described and fitted by the Langmuir, Freundlich, and BET models. The oil removal efficiencies of 72 to 98% obtained for various oil-in-water emulsions showed that the mixture was a good medium for treating such emulsions.

Keywords: Adsorption, Emulsion, Oil-in-Water Emulsion, Oil Removal, Oily Wastewater, Organo-Clay

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Full Text: [2005\Ene Sou27, 209.pdf](2005/Ene%20Sou27,%20209.pdf)

Abstract: Arsenic contamination of surface and subsurface waters has been reported in many parts of the world, the problem is particularly severe in Bangladesh. In view of epidemiological problems of arsenic ingestion, it is imperative to look for an effective technology for removal of arsenic in drinking water. Column studies were conducted at the University of Regina using manganese greensand to remove arsenic from drinking water. Iron addition was found to be necessary to achieve effluent arsenic level of 25 μg/L in manganese greensand filtration system. In view of the possible regulatory requirement to achieve arsenic levels of less than 5 to 10 μg/L, further studies were conducted using iron oxide-coated sand (IOCS). Batch studies with IOCS showed that effluent arsenic level could be achieved below 5 to 10 μg/L levels. High adsorption capacity (136 μg/g) of the IOCS showed that the media could be effectively used for achieving less than 5 μg/L of effluent arsenic level in the treatment systems, particularly in small water utilities. A preliminary study was conducted to remove arsenic from drinking water using rusticles containing bacteria, and bacterial growth in arsenic solution was also studied.

Keywords: Adsorption, Arsenic, Bacteria, Filtration, Water Treatment, West-Bengal, India, Groundwater, Bangladesh, Calamity, Districts, World

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Full Text: [2005\Ene Sou27, 1167.pdf](2005/Ene%20Sou27,%201167.pdf)

Abstract: The aim for this research is to study inexpensive and effective metal ion adsorbents from biomass sources of modified lignin to offer these adsorbents as replacements for existing commercial materials. The initial concentrations were increased up to 12.7 ppm for Pb2+, Cd2+, and Zn2+ in order to reach the plateau values which represent saturation of the active points which are available for interaction with metal ions on the lignin samples. The maximum adsorption capacities are 11.3, 17.5, and 7.7 mg per g of the lignin for Zn2+, Pb2+, and Cd2+, respectively. The maximum adsorption capacity is higher than 20 mg per g of the lignin for Cu2+ ion. The maximum adsorption percentage is 96.7 for Pb2+ for 4 h at 330 K and is 95.0 for Zn2+ for 10 h at 290 K. The adsorption of all heavy metal ions first increases with pH and almost reaches a plateau value around 4.0 for Cu2+, 4.5 for Zn2+, 5.0 for Pb2+. High adsorption at higher pH values implies that metal ions interact with lignin by ion exchange.

Keywords: Adsorption, Binding, Biomass, Black Liquor, Black-Liquor, Cadmium, Capacity, Cu2+, Cupric Ion, Dyed Cellulosic Materials, Heavy Metal, Heavy Metal Ions, Interaction, Ion, Ion Exchange, Lignin, Materials, Mercury, Modified Lignin, Onion Skin, pH, pH Values, Pinus-Pinaster Bark, Pulping, Research, Saturation, Sorption, Sources, Toxic Metal, Waste Water, Wastes, Zinc

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Full Text: [2005\Ene Sou27, 1449.pdf](2005/Ene%20Sou27,%201449.pdf)

Abstract: The aim for this research is to study inexpensive and effective metal ion adsorbents from biomass sources of modified lignin to offer these adsorbents as replacements for existing commercial materials. The Cr(III) and Cr(VI) binding properties of modified lignin from wood sawdust were studied. The maximum amounts of adsorption are 9.3 and 25.0 mg/g lignin for Cr(VI) and Cr(III) ions for 240 min at 290 K, respectively. As the pH of the solution increases from 2.0 to 6.0, Cr(III) ions show an increase in adsorption to the lignin with optimum adsorption occurring between pH 4.5 and 5.5. The maximum adsorption percentage is 39.5 for Cr(VI) for 240 min at 330 K, and is 67.8 for Cr(III) for 240 min at 330 K.

Keywords: Adsorption, Aquatic Environment, Bark, Biomass, Cadmium, Chromium, Chromium Ions, Cr(VI), Ion, Lead, Lignin, Materials, Modified Lignin, pH, Properties, Removal, Research, Sorption, Sources, Water, Wood, Zinc

# Title: Energy Sources Part A-Recovery Utilization and Environmental Effects

Full Journal Title: [Energy Sources Part A-Recovery Utilization and Environmental Effects](http://www.informaworld.com/smpp/title~content=t713770930)

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ISSN: 1556-7036

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

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Full Text: [2006\Ene Sou Par A-Rec Uti Env Eff28, 1493.pdf](2006/Ene%20Sou%20Par%20A-Rec%20Uti%20Env%20Eff28,%201493.pdf)

Abstract: Brown coal, a relatively abundant and inexpensive material is currently being investigated as an adsorbent to remove some contaminants from aqueous solution. The adsorption of some heavy metals from aqueous solutions on the brown coals was studied as a function of pH, contact time, adsorbent dosage and concentration of metal solutions. A carboxyl, phenolic hydroxyl, and metoxyl functional group present on the coal surface was the adsorption site to remove metal ions from solution by means of ion exchange and hydrogen bonding. Effective removal of heavy metals was achieved at pH values of 4.0-5.0. The experimental data have been analyzed using the Langmuir on isotherm models. Under optimized conditions, the percentage of metal removal by brown coal adsorption was over 80%.

Keywords: Adsorption, Sorbent, Brown Coal, Removal, Copper, Zinc, Lead, Cadmium, Polyacrylamide-Grafted Sawdust, Sulfurized Activated Carbon, Heavy-Metals, Aqueous-Solution, Waste-Water, Industrial Wastewaters, Adsorption Properties, Hexavalent Chromium, Chelating Resin, Humic-Acid

? Arslan, G., Çetin, S. and Pehlivan, E. (2007), Removal of Cu(II) and Ni(II) from aqueous solution by lignite-based humic acids. *Energy Sources Part A-Recovery Utilization and Environmental Effects*, **29** (7), 619-630.

Full Text: [2007\Ene Sou Par A-Rec Uti Env Eff29, 619.pdf](2007/Ene%20Sou%20Par%20A-Rec%20Uti%20Env%20Eff29,%20619.pdf)

Abstract: The removals of Cu(II) and Ni(II) metal ions from an aqueous solution were investigated by using humic acids (HAs) in a batch arrangement. HAs were prepared by using alkaline extraction, following sedimentation and acidic precipitation from three Turkish lignites: Ilgin, Beysehir, and Ermenek. The interactions of Cu(II) and Ni(II) with solid HAs and influence of three parameters (initial metal concentration, solution pH and temperature) on the removal of metals were studied. Adsorption equilibrium was achieved in about 120 min for Cu(II) and Ni(II) ions. The sorption of Cu(II) and Ni(II) on the surface of HAs depended strongly on the pH, and increased with increasing of pH and the initial concentration of metal. The sorption of Cu(II) was higher than that of Ni(II) for HAs. The equilibrium relationship between adsorbent and adsorbate is described by adsorption isotherms at a fixed temperature 35°C, at pH similar to 4.0. The Langmuir adsorption isotherm was used to describe observed sorption phenomena. It was observed that the maximum adsorption capacity of Cu(II)/g was 0.27 mmol for Ilgin (HA(1)) and Beysehir (HA(2)), 0.19 mmol for Ermenek (HA(3)) and that of Ni(II)/g was 0.28 mmol for HA(1), 0.24 mmol for HA(2), 0.18 mmol for HA(3) at pH 4.1, respectively. More than 80% of Cu(II) was removed by HA(1) and HA(2) and 58% by HA(3), 82% of Ni(II) was removed by HA(1), 71% by HA(2) and 52% by HA(3) from aqueous solution. The adsorption of Cu(II) and Ni(II) was higher between pH 4.1 and 5.1 for all HAs, and maximum sorption was observed at pH 4.1. The increase in temperature caused a slight decrease in the value of the equilibrium constant (Kc) for the sorption of metal ions. Adsorption isotherms and kinetics data of Cu(II) and Ni(II) ions removed by HAs are presented and discussed.

Keywords: Humic Acid, Metal Removal, Sorption, Turkish Lignite, Adsorption Properties, Waste Streams, Metal-Ions, Coals, Chromium, Sorbents, Sorption, Peat, Nickel(II), Dye

# Title: Energy World

Full Journal Title: Energy World

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ISSN:

Issues/Year:

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Subject Categories:

: Impact Factor

Asquith, R.S., McKay, G. and Murphy, W.R. (1975), Energy and education. *Energy World*, **15**, 3-4.

Anderson, R.S., Asquith, R.S., Brown, J.M. and McKay, G. (1977), The Northern Ireland gas industry. *Energy World*, **July**, 16-18.

McConnell, A.J., McKay, G., Murphy, W.R. and Williams, J.D. (1978), Optimization study on operation of a light distillate reforming gas plant. *Energy World*, (47), 8-11.

Holland, C.R. and McKay, G. (1981), Spray drier energy savings in a food processing plant. *Energy World*, **December**, 8-11.

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McKay, G. (1982), Cost effectiveness of energy conservation measures in buildings. *Energy World*, **July**, 2-6.

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Pericleous, K.A. (1988), Computer modelling for the analysis of fluid flow, heat transfer and combustion in industry. *Energy World*, **161**, 9-11.

# Title: Enfermedades Infecciosas y Microbiología Clínica

Full Journal Title: [Enfermedades Infecciosas y Microbiologia Clinica](http://ees.elsevier.com/eimc/)

ISO Abbreviated Title:

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Issues/Year:

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Language:

Publisher: Elsevier Science BV, Amsterdam

Publisher Address:

Subject Categories:

: Impact Factor

? Pascual, A., Almirante, B., Martinez-Martinez, L. and Miro, J.M. (2003), Report from the editorial board. *Enfermedades Infecciosas y Microbiología Clínica*, **21** (1), 1-2.

Full Text: Enf Inf Mic Cli21, 1.pdf

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Full Text: Enf Inf Mic Cli21, 388.pdf

Keywords: Bibliometric Indicators, Scientific Activity

? Ramos, J.M., Gutierrez, F. and Royo, G. (2005), Scientific production in microbiology and affinity areas in Spain during 1990-2002. *Enfermedades Infecciosas y Microbiología Clínica*, **23** (7), 406-414.

Full Text: Enf Inf Mic Cli23, 406.pdf

Abstract: BACKGROUND. To analyze the production and repercussions of the scientific activity of Spanish authors in the fields of microbiology, mycology, parasitology and virology. METHODS. Documents published during the period of 1990 to 2000 compiled on the MEDLINE database >(WEBSPIRS 4.2) were retrieved using the following search terms (‘Spain’ OR ‘Espana’) and (‘microb\*’ OR ‘virol\*’ OR ‘parasit\*’ OR ‘bacter\*’ OR ‘micol\*’ OR ‘mycol\*’ OR ‘retrovirus\*) in the field, author’s address. RESULTS. A total of 5259 documents were retrieved. Over the period studied, the number of documents published annually increased two-fold, from 256 documents in 1990 to 512 in 2002 (r = 0.92; p < 0.001), particularly those in foreign journals, from 175 to 447 documents (r = 0.95; p < 0.001). 50.9% of the documents came from universities, 35.8% from hospitals, 5.4% from the Consejo Superior de Investigaciones Cientificas (CSIC) (5.4%), and 5.3% from the Instituto de Salud Carlos III. The CSIC centers (r2 = 0.90), and universities (r2 = 0.88) showed the highest rate of growth in the number of publications. The University of Barcelona (5.3%) had the largest number of publications among teaching institutions and Hospital Ramon y Cajal (2.9%) was the first among hospitals. The Autonomous Communities of Madrid (29.2%) and Catalonia (17.5%) showed the highest scientific production. The mean expected impact factor for all the published documents was 2.340. The expected impact factor grew from 1.977 in 1990 to 2.507 en 2002 (r2 = 0.81). CONCLUSION. The published scientific production of Spanish researchers and the repercussion of these studies in the field of microbiology and related areas increased during the period of 1990 to 2002, particularly in the number of articles published in foreign journals. The Universities are the most productive institutions in this field.

Keywords: Bibliometric Indicators, Bibliometry, Biomedicine, European-Union, Impact, Impact Factor, Journals, Microbiology, Mycology, Parasitology, Publications, Science Citation Index, Scientific Information, Scientific Production, Spain, Universities, Virology

Aleixandre-Benavent, R., Gonzalez-Alcaide, G., Alonso-Arroyo, A., Castellano-Gomez, M. and Valderrama-Zurian, J.C. (2007), Gender analysis among articles published in *Enfermedades Infecciosas y Microbiología Clínica* (2001-2005). *Enfermedades Infecciosas y Microbiología Clínica*, **25** (10), 619-626.

Full Text: [2007\Enf Inf Mic Cli25, 619.pdf](2007/Enf%20Inf%20Mic%20Cli25,%20619.pdf)

Abstract: BACKGROUND. There is growing concern for promoting equality between sexes and full integration of women in research activities. The purpose of this study is to identify the bibliometric characteristics of articles published during the 2001-2005 period in Enfermedades Infecciosas y Microbiología Clínica (EIMC) from the perspective of gender. METHOD. EIMC records for 2001-2005 were obtained from the Science Citation Index database and differences according to sex were calculated for the following indicators: year of publication, type of document, number and order of author signatures, number of collaborators, and the signature/article index at the institutional and geographical level. RESULTS. A total of 2,163 authors were identified, 1,220 (56.4%) men and 943 (43.6%) women. The greatest of contribution from women was in original articles (42.32% of signatures). Excluding the Centro Nacional de Microbiologia (Spanish National Center for Microbiology), the participation of women was lower than men in the most productive institutions. There were significant differences regarding the number of papers published and the number of collaborators; with greater productivity for men and a higher rate of collaboration for women. DISCUSSION. Studies on scientific activity according to gender provide essential information to establish the basis for a policy of equality in this regard. A yearly increase of almost 1 % was seen in the number of female authors contributing articles to the EIMC, which, if the trend continues, will result in parity in coming years. Nevertheless, the presence of women in positions of high productivity remains low. The causes of this difference should be identified and corrected.

Keywords: Analysis, Background, Bibliometric, Characteristics, Collaboration, Database, Equality, Female, Gender, Index, Indicators, Information, Institutions, Integration, Men, Papers, Parity, Participation, Policy, Productivity, Publication, Purpose, Records, Research, Science Citation Index, Sex, Trend, Women

? Gonzalez-Alcaide, G., Valderrama-Zurian, J.C. and Ramos-Rincon, J.M. (2010), Scientific productivity, collaboration and research areas in *Enfermedades Infecciosas y Microbiología Clínica* (2003-2007). *Enfermedades Infecciosas y Microbiología Clínica*, **28** (8), 509-516.

Full Text:

Abstract: Introduction: Collaboration is essential for biomedical research. The Carlos III Health Institute (the Spanish national public organization responsible for promoting biomedical research) has encouraged scientific collaboration by promoting Thematic Networks and Cooperative Research Centres. Scientific collaboration in Enfermedades Infecciosas y Microbiologia Clinica journal is investigated. Methods: Papers published in Enfermedades Infecciosas y Microbiologia Clinica in the period 2002-2007 have been identified. Bibliometrics and Social Network Analysis methods have been carried out in order to quantify and characterise scientific collaboration and research areas. Results: A total of 805 papers generated by 2,289 authors and 326 institutions have been analysed. There were 36 research groups involving 138 authors identified. The Collaboration Index for articles was 5.5. Institutional collaboration was determined in 75% of articles. The collaboration between departments or units of the same institution prevails (43%), followed by intra-regional domestic collaboration (41%) and inter-regional domestic collaboration (14%). Hospital centres were the main institutional sector responsible of research (88% of papers), with 68% of articles cited. Sida/VIH (AIDS/HIV) is the main research area (n=114), followed by Staphylococcal Infections (n=33). Conclusions: Notable collaboration and citation rates have been observed. Research is focused on diseases with the highest mortality rates caused by infectious diseases in Spain. (C) 2009 Elsevier Espana, S.L. All rights reserved.

Keywords: Authorship, Bibliometric Analysis, Bibliometrics, Biomedical Research, Citation, Clinical Medicine, Coauthorship, Collaboration, Cooperative Behaviour, Domestic Collaboration, European-Union, Infectious Disease, Infectious-Diseases, Inter-Institutional Relations, Medline, Microbiology, Periodicals as Topic, Research, Scientific Collaboration, Scientific Productivity, Spain, Spain

# Title: Engenharia Sanitaria e Ambiental

Full Journal Title: Engenharia Sanitaria e Ambiental

ISO Abbreviated Title:

JCR Abbreviated Title:

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Publisher:

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Subject Categories:

: Impact Factor

? Módenes, A.N., Pietrobelli, J.M.T.D., Quinones, F.R.E., Suzaki, P.Y.R., Alflen, V.L. and Klen, M.R.D.F. (2009), Biosorption potential of zinc by *egeria densa* macrophytes. *Engenharia Sanitaria e Ambiental*, **14** (4), 465-470.

Full Text: [2009\Eng San Amb14, 465.pdf](2009/Eng%20San%20Amb14,%20465.pdf)

Abstract: In this paper, the removal potential on Zn ion by macrophyte Egeria densa has been studied. The influence of the metal solution pH, the plant drying and the metal solution temperature, and biosorbent grain size was previously studied in batch systems. Adsorption kinetic and equilibrium experiments of metals onto E. densa were performed under controlled temperature and permanent shaking. In adsorption kinetic tests for Zn(II) the equilibrium time was around 45 min. The biosorption kinetic data were well fitted by a pseudo-second order model. The equilibrium data at pH 5 were described a rather better by the Langmuir isotherm than the Freundlich one, with an adsorption rate and maximum metal content values of 0.829L g-1 and 0,92 mequiv g-1, respectively, for Langmuir model. The macrophytes E. densa could be used as biosorbent material in industrial effluent treatment system.

Keywords: Adsorption, Adsorption Kinetic, Adsorption Rate, Batch, Biosorbent, Biosorption, Biosorption Kinetic, Cadmium Biosorption, Data, Effluent Treatment, Egeria Densa, Equilibrium, Experiments, Freundlich, Industrial Effluent, Ions, Isotherm, Kinetic, Langmuir, Langmuir Isotherm, Langmuir Model, Macrophytes, Metal, Metals, Model, Permanent, pH, Plant, Potential, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Removal, Size, Solution, Systems, Temperature, Treatment, Zinc, Zn(II)

# Title: Engineering and Architecture Journal

Full Journal Title: Engineering and Architecture Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

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Journal Country/Territory:

Language:

Publisher: Cukurova University Press

Publisher Address:

Subject Categories:

: Impact Factor

? Başiıbüyük, M., Çakmak. M.E., Keskinkan, O. and Arslan, H.A. (2004), Application of pseudo isotherms on the adsorption of Basic Blue 41 onto live activated sludge. *Engineering and Architecture Journal*, **19** (1), 187-193. (In Turkish)

Full Text: [2004\Eng Arc J19, 187.pdf](2004/Eng%20Arc%20J19,%20187.pdf)

# Title: Engineering Costs and Production Economics

Full Journal Title: [Engineering Costs and Production Economics](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=7258&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=7dec9031f50acdda7fb50785edec55fa)

ISO Abbreviated Title: Eng. Cost. Prod. Econ.

JCR Abbreviated Title: Eng Cost Prod Econ

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Publisher: Elsevier Science BV, Amsterdam

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Subject Categories:

: Impact Factor

McKay, G. and Holland, C.R. (1981), Energy savings from steam losses on an oil refinery. *Engineering Costs and Production Economics*, **5** (3-4), 193-203.

Abstract: A study of steam and condensate utilisation on a refinery has been undertaken. Based on the total amount of steam produced on the plant approximately 36% was being returned to the system as condensate. Since 75% should be returned, a large quantity of steam and condensate was being lost. A total of 7100 kg h-1 condensate and steam losses were detected of which 5450 kg h-1 were condensate losses. Nevertheless, in financial terms, the economic losses are greater due to the 1650 kg h-1 of steam being lost.

A survey of the plant to locate and measure losses, showed that the major part of the total loss could be attributed to a small number of large steam or condensate leaks. The loss of steam due to malfunctioning of steam traps has been considered and 25% were found to be passing live steam. Heat losses from condensate pipes were measured and the economic justification for lagging the pipes is considered. Finally, efficiency tests were carried out on the main boiler which had an efficiency of 80%.

In economic terms a financial saving of over £ 121 500 per year is attainable based on the results of this investigation.

McKay, G. and Holland, C.R. (1983), Economic appraisal of energy conservation measures on a hydrofiner unit. *Engineering Costs and Production Economics*, **7** (3), 195-203.

Abstract: An energy conservation study has been undertaken on a hydrofiner unit in an oil refinery. The results in energy terms and overall financial savings have been discussed in a previous paper by Holland and McKay (1981). However, a critical financial appraisal of the various proposed schemes was not undertaken. This paper compares the proposed energy conservation measures by various costing techniques, including:

1. (i) return on investment,

2. (II) pay-back method,

3. (iii) net present value,

4. (iv) internal rate of return.

# Title: Engineering in Life Sciences

Full Journal Title: [Engineering in Life Sciences](http://www3.interscience.wiley.com/cgi-bin/jhome/85007410)

ISO Abbreviated Title:

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ISSN: 1618-0240

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Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Abu Al-Rub, F.A., Kandah, M. and Al-Dabaibeh, N. (2002), Nickel removal from aqueous solutions using sheep manure wastes. *Engineering in Life Sciences*, **2** (4), 111-116.

Full Text: [2002\Eng Lif Sci2, 111.pdf](2002/Eng%20Lif%20Sci2,%20111.pdf)

Abstract: This paper reports a study on the potential use of sheep manure waste (SMW) for the removal of nickel ions from aqueous solutions. The adsorption of nickel ions from aqueous solutions on SMW has been studied as functions of contact time, initial pH, amount of sorbent, sorbent particle size, initial concentration of nickel ions, salt, and chelating agents. The experimental results showed that the SMW has a high affinity for nickel binding, where 79 % removal of 100 ppm initial nickel ions concentration was obtained using 8.0 mg SMW/mL, at pH 6.5 in 4 minutes equilibrium time. The equilibrium adsorption data were analyzed using four different isotherms: the Langmuir, Freundlich, Redlich-Peterson, and Sips isotherm equations. The results of the kinetic studies showed that the adsorption of nickel ions on SMW is a pseudo-first order with respect to the nickel ions solution concentration.

Keywords: Adsorption, Aqueous Solutions, Heavy Metals, Kinetics

? Kandah, M., Abu Al-Rub, F.A. and Al-Dabaibeh, N. (2002), Competitive adsorption of copper-nickel and copper-cadmium binaries on SMW. *Engineering in Life Sciences*, **2** (8), 237-243.

Full Text: [2002\Eng Lif Sci2, 237.pdf](2002/Eng%20Lif%20Sci2,%20237.pdf)

Abstract: In this study, the technical feasibility of using a low-cost sorbent, sheep manure waste (SMW), for the removal of copper, nickel and cadmium ions from aqueous solutions containing Cu2+ --Cd2+ or Cu2+ --Ni2+ binaries is investigated. The scope of the study includes the investigation of the affinity of each metal ion in the presence of the other. Experimental results showed that the SMW has high affinity for the three studied heavy metals, and the affinity of the SMW for these metals is in the order copper > cadmium > nickel. The presence of copper in a solution containing Ni2+ or Cd2+ reduces significantly the percentage removal of both nickel and cadmium. On the other hand, the percentage removal of copper was not affected significantly by the presence of either nickel or cadmium. The equilibrium adsorption data were fit very well with Langmuir, Freundlich, Redlich-Peterson, and Sips isotherm equations. The prediction of the binary adsorption from single metal adsorption data was in fair agreement with the experimental results. The role of ion exchange and carboxyl groups in the adsorption process were also studied.

Keywords: Adsorption, Aqueous Solutions, Heavy Metals

Akhtar, N., Iqbal, J. and Iqbal, M. (2004), Enhancement of lead(II) biosorption by microalgal biomass immobilized onto loofa (*Luffa cylindrica*) sponge. *Engineering in Life Sciences*, **4** (2), 171-178.

Full Text: [E\Eng Lif Sci4, 171.pdf](E/Eng%20Lif%20Sci4,%20171.pdf)

Abstract: A unicellular green microalga, *Chlorella sorokiniana*, was immobilized on loofa (*Luffa cylindrica*) sponge and successfully used as a new biosorption system for the removal of lead(II) ions from aqueous solutions. The biosorption of lead(II) ions on both free and immobilized biomass of *C.* *sorokiniana* was investigated using aqueous solutions in the concentration range of 10-300 mg/L. The biosorption of lead(II) ions by *C.* *sorokiniana* biomass increased as the initial concentration of lead(II) ions increased in the medium. The maximum biosorption capacity for free and immobilized biomass of *C.* *sorokiniana* was found to be 108.04 and 123.67 mg lead(II)/g biomass, respectively. The biosorption kinetics were found to be fast, with 96 % of adsorption within the first 5 min and equilibrium reached at 15 min. The adsorption of lead(II) both by free and immobilized *C.* *sorokiniana* biomass followed the Langmuir isotherm. The biosorption capacities were detected to be dependent on the pH of the solution, and the maximum adsorption was obtained at a solution pH of about 5. The effect of light metal ions on lead(II) uptake was also studied and it was shown that the presence of light metal ions did not significantly affect lead(II) uptake. The loofa sponge-immobilized *C. sorokiniana* biomass could be regenerated using 0.1 M HCl, with up to 99 % recovery. The desorbed biomass was used in five biosorption-desorption cycles, and no noticeable loss in the biosorption capacity was observed. In addition, fixed bed breakthrough curves for lead(II) removal were presented. These studies demonstrated that loofa sponge-immobilized biomass of *C.* *sorokiniana* could be used as an efficient biosorbent for the treatment of lead(II) containing wastewater.

Keywords: Biomass, Biosorption, Heavy Metals, Wastewater

Gavrilescu, M. (2004), Removal of heavy metals from the environment by biosorption. *Engineering in Life Sciences*, **4** (3), 219-232.

Full Text: [E\Eng Lif Sci4, 219.pdf](E/Eng%20Lif%20Sci4,%20219.pdf)

Abstract: The pollution of the environment with toxic metals is a result of many human activities, such as mining and metallurgy, and the effects of these metals on the ecosystems are of large economic and public-health significance. This paper presents the features and advantages of the unconventional removal method of heavy metals - biosorption - as a part of bioremediation. Bioremediation consists of a group of applications, which involve the detoxification of hazardous substances instead of transferring them from one medium to another, by means of microbes and plants. This process is characterized as less disruptive and can be often carried out on site, eliminating the need to transport the toxic materials to treatment sites. The biosorption (sorption of metallic ions from-solutions by live or dried biomass) offers an alternative to the remediation of industrial effluents as well as the recovery of metals contained in other media. Biosorbents are prepared from naturally abundant and/or waste biomass. Due to the high uptake capacity and very cost-effective source of the raw material, biosorption is a progression towards a perspective method. The mechanism by which microorganisms take up metals is relatively unclear, but it has been demonstrated that both living and non-living biomass may be utilized in biosorptive processes, as they often exhibit a marked tolerance towards metals and other adverse conditions. One of their major advantages is the treatment of large volumes of effluents with low concentrations of pollutants. Models developed were presented to determine both the number of adsorption sites required to bind each metal ion and the rate of adsorption, using a batch reactor mass balance and the Langmuir theory of adsorption to surfaces or continuous dynamic systems. Two main categories of bioreactors used in bioremediation - suspended growth and fixed film bioreactors - are discussed. Reactors with varying configurations to meet the different requirements for biosorption are analyzed considering two major groups of reactors - batch reactors and continuous reactors. Biosorption is treated as an emerging technology effective in removing even very low levels of heavy metal.

Keywords: Accumulation, Adsorption, Airlift Bioreactor, Aqueous-Solutions, Biomass, Contaminated Sediments, Lead, Microorganisms, *Phanerochaete-Chrysosporium*, *Saccharomyces-Cerevisiae*, Sorption

Say, R., Yilmaz, N. and Denizli, A. (2004), Removal of chromium(VI) ions from synthetic solutions by the fungus *Penicillium purpurogenum*. *Engineering in Life Sciences*, **4** (3), 276-280.

Full Text: [E\Eng Lif Sci4, 276.pdf](E/Eng%20Lif%20Sci4,%20276.pdf)

Abstract: The ability of Penicillium purpurogenum to bind high amounts of chromium(VI) from aqueous solutions is demonstrated. Cr(VI) adsorption capacity increases with time during the first four hours and then leveled off toward the equilibrium adsorption capacity. Biosorption of Cr(VI) ions reached equilibrium in four hours. Binding of Cr(VI) ions with Penicillium purpurogenum biomass was clearly pH dependent. Cr(VI) loading capacity increased with increasing pH. The adsorption of Cr(VI) ions reached a plateau value at a pH of approx. 6.0. The maximum capacity of adsorption of Cr(VI) ions onto the fungal biomass was 36.5 mg/g. Adsorption behavior of Cr(VI) ions can be approximately described with the Langmuir equation. When applying the Langmuir model, the maximum adsorption capacity (Qmax) and the Langmuir constant were found to be 40 mg/g and 3.9×10-3 mg/L. Elution of Cr(VI) ions was performed by means of 0.5 M HCl. It was possible to use the biomass of Penicillium purpurogenum for six cycles for biosorption.

Keywords: Activated Carbon, Adsorption, Aqueous-Solution, Biomass, Biosorption Characteristics, Cadmium, Heavy-Metals, Industrial Wastewaters, *Phanerochaete-Chrysosporium*, Recovery

? Ahluwalia, S.S. and Goyal, D. (2005), Removal of heavy metals by waste tea leaves from aqueous solution. *Engineering in Life Sciences*, **5** (2), 158-162.

Full Text: [2005\Eng Lif Sci5, 158.pdf](2005/Eng%20Lif%20Sci5,%20158.pdf)

Abstract: In this paper, tea leaves were shown to be an effective, low-cost biosorbent. Removal of lead, iron, zinc and nickel from 20 mg/L metal solution by dried biomass of waste tea leaves amounted to 96, 91, 72 and 58%, respectively, at equilibrium, which followed Langmuir and Freundlich adsorption isotherms. Adsorption of metal was in the order of Pb > Fe > Zn > Ni from 5-100 mg/L of metal solution. From a multi-metallic mixture, 92.5, 84 and 73.2% of lead, iron and zinc, respectively, were removed. Fourier transform infrared (FTIR) studies indicated that the carboxyl group was involved in the binding of lead and iron, whereas the amine group was involved in the binding of nickel and zinc. A flow through sorption column packed with dried biomass demonstrated a sorption capacity of 73 mg Pb/g of biomass, indicating its potential in cleaning metal containing wastewater. The metal laden biomass obtained could be disposed off by incineration.

Keywords: Adsorption, Binding, Biomass, Biosorption Characteristics, Cadmium, Copper, Equilibrium, Ions, Isotherms, Lead, Sorption, Water

? Zandvoort, M.H., van Hullebusch, E.D., Fermoso, F.G. and Lens, P.N.L. (2006), Trace metals in anaerobic granular sludge reactors: Bioavailability and dosing strategies. *Engineering in Life Sciences*, **6** (3), 293-301.

Full Text: [2006\Eng Lif Sci6, 293.pdf](2006/Eng%20Lif%20Sci6,%20293.pdf)

Abstract: The trace metal dynamics in anaerobic granular sludge bed reactors and their influence on reactor performance is reviewed in this paper. An insight into the metal dynamics is required from a practical point of view in order to be able to early recognize limitations for essential trace elements, viz., to know when dosing of these elements is required in full-scale anaerobic bioreactor applications. Further such knowledge is indispensable for a rational dosage of these metals, e.g., to ensure maximum substrate conversion rates and to prevent disturbances in reactor performance using a minimum amount of metals. Therefore, the retention, accumulation and release of trace metals in anaerobic granular sludge and the factors affecting these processes need to be known.

Keywords: Soluble Microbial Products, Sulfate-Reducing Bacteria, Methanobacterium-Thermoautotrophicum, Heavy-Metals, Methanol Degradation, Formylmethanofuran Dehydrogenase, Sequential Extraction, Waste-Water, Molybdenum Requirement, Cobalt Sorption

? Orhan, Y., Hrenovič, J. and Büyükgüngör, H. (2006), Biosorption of heavy metals from wastewater by biosolids. *Engineering in Life Sciences*, **6** (4), 399-402.

Full Text: [2007\Eng Lif Sci6, 399.pdf](2007/Eng%20Lif%20Sci6,%20399.pdf)

Abstract: In a study where the removal of heavy metals from wastewater is the primary aim, the biosorption of heavy metals onto biosolids prepared as Pseudomonas aeruginosa immobilized onto granular activated carbon was investigated in batch and column systems. In the batch system, adsorption equilibriums of heavy metals were reached between 20 and 50 min, and the optimal dosage of biosolids was 0.3 g/L. The biosorption efficiencies were 84, 80, 79, 59 and 42% for Cr(VI), Ni(II), Cu(II), Zn(II) and Cd(II) ions, respectively. The rate constants of biosorption and pore diffusion of heavy metals were 0.013- 0.089 min-1 and 0.020-0.690 min-0.5. In the column systems, the biosorption efficiencies for all heavy metals increased up to 81-100%. The affinity of biosorption for various metal ions towards biosolids was decreased in the order: Cr = Ni > Cu > Zn > Cd.

Keywords: Pseudomonas-Aeruginosa, Aqueous-Solutions, Removal, Mercury

? Keskinkan, O., Goksu, M.Z.L., Yuceer, A. and Basibuyuk, M. (2007), Comparison of the adsorption capabilities of *Myriophyllum spicatum* and *Ceratophyllum demersum* for zinc, copper and lead. *Engineering in Life Sciences*, **7** (2), 192-196.

Full Text: [2007\Eng Lif Sci7, 192.pdf](2007/Eng%20Lif%20Sci7,%20192.pdf)

Abstract: Industrial wastewaters contain various heavy metal components and therefore threaten aquatic bodies. Heavy metals can be adsorbed by living or non-living biomass. Submerged aquatic plants can be used for the removal of heavy metals. This paper exhibits the comparison of the adsorption properties of two aquatic plants Myriophyllum spicatum and Ceratophyllum demersum for lead, zinc, and copper. The data obtained from batch studies conformed well to the Langmuir Model. Maximum adsorption capacities (q(max)) were obtained for both plant species and each metal. The maximum adsorption capacities (q(max)) achieved with M. spicatum were 10.37 mg/g for Cu2+, and 15.59 mg/g for Zn2+ as well as 46.49 mg/g for Pb2+ and with C. demersum they were 6.17 mg/g for Cu2+ 13.98 mg/g for Zn2+ and 44.8 mg/g for Pb2+. It was found that M. spicatum has a better adsorption capacity than C. demersum for each metal tested. Gibbs free energy and the specific surface area based on the q(max) values were also determined for each metal.

Keywords: Bioremediation, Heavy Metals, Plants, Wastewater, Aqueous-Solutions, Aquatic Plant, Metal-Ions, Nonliving Biomass, Heavy-Metals, Biosorption, Removal, Sorption, Waste, Equilibrium

? Yan, C. and Viraraghavan, T. (2008), Mechanism of biosorption of heavy metals by *Mucor rouxii*. *Engineering in Life Sciences*, **8** (4), 363-371.

Full Text: [2008\Eng Lif Sci8, 363.pdf](2008/Eng%20Lif%20Sci8,%20363.pdf)

Abstract: Fungi such as *Aspergillus niger* and Mucor rouxii are capable of removing heavy metals from aqueous solutions. The role various functional groups play ill the cell wall of M. rouxii in metal biosorption of lead, cadmium, nickel and zinc Was investigated in this paper. The biomass was chemically treated to modify the functional carboxyl, amino and phosphate groups. These modifications were examined by means of infrared spectroscopy. It was found that ail esterification of the carboxyl groups and phosphate and a methylation of the amine groups significantly decreased the biosorption of the heavy metals studied. Thus, the carboxylate, amine and phosphate groups were recognized as important in the biosorption of metal ions by M. rouxii biomass. The role the lipids fraction play was not significant. The study showed that Na, K, Ca and Mg ions were released from the biomass after biosorption of Pb, Cd, Ni and Zn, indicating that ion exchange was a key mechanism in the biosorption of metal tons by M. rouxii biomass.

Keywords: Adsorption, Amino, Aqueous Solutions, Aqueous-Solution, *Aspergillus niger*, Aspergillus-Niger, Biomass, Biosorbent, Biosorption, Cadmium, Esterification, Exchange, Fungal Biomass, Fungi, Ganoderma-Lucidum, Heavy Metals, Infrared, Ion Exchange, Ions, Lead, Mechanism, Metal Ions, Metals, Mucor Rouxii, Ni, Nickel, Pb, pH, Removal, Rhizopus-Arrhizus Biomass, Uranium Biosorption, Zinc, Zn

? Aljundi, I.H. and Khleifat, K.M. (2010), Biosorption of lead by E. coli strains expressing Vitreoscilla hemoglobin: Isotherm modeling with two- and three-parameter models. *Engineering in Life Sciences*, **10** (3), 225-232.

Full Text: [2010\Eng Lif Sci10, 225.pdf](2010/Eng%20Lif%20Sci10,%20225.pdf)

Abstract: Biosorption is presented as an alternative choice to traditional physicochemical means for removing toxic metals from groundwater and wastewaters. Removal of lead (Pb) from solutions was studied using Escherichia coli (parental) and Vitreoscilla hemoglobin (VHb)-expressing E. coli (transformed) cells. Pb biosorption was increased in bacterial hemoglobin-expressing E. coli cells grown in Luria broth B containing different concentrations of Pb2+. The maximum Pb2+ biosorption of transformed and parental cells was determined to be 612 and 370 mg Pb/g biomass, respectively. The inhibitory effect of Pb2+ on the parental strain was determined at 10 ppm. However, in transformed cells, Pb2+ was lethal at 100 ppm. The optimum aeration required for the transformed cells was lower than that for the parental strain on a growth yield basis. A linear correlation was established between the biosorption and uptake amounts. The biosorption process was analyzed using two-parameter (Langmuir, Freundlich, Temkin) and three-parameter models (Sips, Redlich-Peterson, Toth). The chi-square test was used to compare these models. It was demonstrated that the three-parameter model is better in describing biosorption equilibria, while the Sips equation showed the best description for both types of cells.

Keywords: Activated Carbon, Adsorption, Alternative, Aqueous-Solutions, Bacillus-Subtilis, Bacterial Hemoglobin, Bacterial Hemoglobin, Biomass, Biosorption, Cadmium Uptake, Chi-Square, Choice, Correlation, Equilibria, Escherichia, Escherichia Coli, Escherichia-Coli, Freundlich, Groundwater, Growth, Heavy-Metals, Hemoglobin, Inhibitory Effect, Intracellular Expression, Ions, Isotherm, Isotherm Model, Langmuir, Lead, Metals, Model, Modeling, Models, Pb, Pb2+, Redlich-Peterson, Removal, Solutions, Toxic, Toxic Metals, Uptake, Vitreoscilla, Wastewaters

? Yenikaya, C., Atar, E., Olgun, A., Atar, N., Ilhan, S. and Colak, F. (2010), Biosorption study of anionic dyes from aqueous solutions using *Bacillus amyloliquefaciens*. *Engineering in Life Sciences*, **10** (3), 233-241.

Full Text: [2010\Eng Lif Sci10, 233.pdf](2010/Eng%20Lif%20Sci10,%20233.pdf)

Abstract: In this study, the biosorption of two commonly used dyes, namely Acid Blue 225 (AB 225) and Acid Blue 062 (AB 062), from aqueous solutions by Bacillus amyloliquefaciens biomass was studied in a batch system with respect to initial dye concentration, pH, adsorbent dosage, and contact time. The biomass exhibited maximum uptake at pH 1 due to its positive nature at acidic pH and the anionic nature of the dyes. Kinetic studies showed that the biosorption of dyes on biomass was a gradual process. An equilibrium was reached in 90 min for both dyes. The kinetic studies indicated that a pseudo-second-order rate equation was able to provide a realistic description of biosorption kinetics of the dyes. The constants obtained from the pseudo-second-order kinetic model at different temperatures were evaluated and the activation energies for the biosorption of AB 225 and AB 062 were found to be 13.52 and 13.62 kJ/mol, respectively. Isotherm studies pointed out that biosorption of dyes on biomass followed the Langmuir isotherm model. The adsorption capacity of biomass for AB 225 and AB 062 were 111.15 and 112.19 mg/g, respectively. Thermodynamic quantities that characterize the biosorption phenomena, i.e. enthalpy, entropy, and free energy change of the adsorption, were calculated leading to a conclusion on the efficiency of the properties of the biosorbent-dye systems.

Keywords: Acidic Dye, Activation, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacity, Anionic Dyes, Aqueous Solutions, Bacillus, Bacillus Amyloliquefaciens, Batch, Batch System, Biomass, Biosorption, Biosorption Kinetics, Capacity, Chitosan, Concentration, Dye, Dyes, Efficiency, Energy, Enthalpy, Entropy, Equilibrium, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetic Studies, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Model, pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Pseudo-Second-Order Rate, Red, Removal, Solutions, Systems, Thermodynamic, Uptake, Waste-Water

? Yu, J.X., Chi, R.A., He, Z.Y., Qi, Y.F., Zhan, G. and Guo, J. (2011), Combination of biosorption and photodegradation to remove methyl orange from aqueous solutions. *Engineering in Life Sciences*, **11** (3), 309-315.

Full Text: [2011\Eng Lif Sci11, 309.pdf](2011/Eng%20Lif%20Sci11,%20309.pdf)

Abstract: In this study, metal ion-modified biomass of waste beer yeast was prepared to improve its adsorption capacity for an anionic dye: methyl orange. The adsorption capacities of Fe(3+) -, Mg(2+) -, Ca(2+),- and Na(+) -modified biomass preparations for methyl orange were 90.8, 51.3, 23.0, and 20.6 mg/g, which were 30, 17, 8, and 7 times that of the unmodified biomass, respectively. Adsorption isotherm experiments showed that the Freundlich model gave better fits than the Langmuir model for methyl orange adsorption on Fe(3+) -, Mg(2+) -, Ca(2+) -modified and unmodified biomass, whereas on Na(+) -modified biomass the Langmuir model gave better fits. The sorption and desorption kinetics of methyl orange on Fe(3+) - and Mg(2+) - modified biomass both fitted well to the pseudo-second-order kinetic models, with R >= 0.998, and the desorption processes in NaOH solution (pH 12) were very fast in attaining equilibrium, i.e. within 15 min. In order to avoid secondary pollution, the eluent containing the desorbed methyl orange was treated with a photocatalyst: P25. After that, the eluent could be reused, and thus saving a large volume of eluent.

Keywords: Adsorption, Adsorption Isotherm, Arsenic Removal, Bakers-Yeast, Beer Yeast, Biosorption, Dye, Enhancement, Equilibrium, Fungal Biomass, Kinetics, Lead Ions, Methyl Orange, Model, Photodegradation, Pseudo-Second-Order, Rhizopus-Oryzae, Rhodamine-B, Sorption

# Title: Engineering Geology

Full Journal Title: [Engineering Geology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5803&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=24866338a877d51cf1b11992ff6c0862)

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Publisher: Elsevier Science BV

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Subject Categories:

Engineering, Geological Geosciences, Interdisciplinary: Impact Factor

Drakatos, G., Papanastassiou, D., Papadopoulos, G., Skafida, H. and Stavrakakis, G. (1998), Relationship between the 13 May 1995 Kozani-Grevena (NW Greece) earthquake and the Polyphyto artificial lake. *Engineering Geology*, **51** (1), 65-74.

Full Text: [E\Eng Geo51, 65.pdf](E/Eng%20Geo51,%2065.pdf)

Abstract: On 13 May 1995 a strong earthquake of Ms = 6.6 struck the cities of Kozani and Grevena in northwestern Greece. This region is characterized by low seismicity. In the same area, three hydroelectric dams have been operating for the last 30 years. One of them, the Polyphyto dam, is located only 40 km from the epicenter of the 13 May earthquake. In the present work all available seismological aspects of the main event, such as focal properties and source parameters together with foreshock and aftershock characteristics of the earthquake sequence are considered in order to examine whether the water level changes behind the Polyphyto dam induced the unusual seismic activity in this area. Thus, a detailed examination of the seismic activity is made and this is compared to the seismotectonic regime of the region and the reservoir loading from 1976 to 1995. The results show that there is no obvious correlation between seasonal or sharp fluctuations in the water level and the seismicity of the region (except once during 1989). Moreover, comparison with other previous cases of induced seismicity in Greece and in other countries shows no similarities to the Kozani-Grevena earthquake sequence. It is concluded that the Kozani-Grevena earthquake is therefore an event in the framework of the regional seismicity rather than an event triggered by the impounding of the Polyphyto artificial Lake.

Lin, P.S., Lin, J.Y., Hung, J.C. and Yang, M.D. (1998), Assessing debris-flow hazard in a watershed in Taiwan. *Engineering Geology*, **66** (3-4), 295-313.

Full Text: [E\Eng Geo66, 295.pdf](E/Eng%20Geo66,%20295.pdf)

Abstract: This paper presents the results of a pilot study for assessing debris-flow hazards using geographic information system (GIS) techniques. The watershed of the Chen-Yu-Lan River is investigated in this pilot study. Factors that are believed to be critical to the occurrence of debris flow are identified and considered in the assessment of debris-flow hazards. Using the spatial analysis feature of GIS, the impact of these factors, expressed in terms of debris-flow hazard (DH) index, is calculated. By taking a simple summation of all DH indexes according to each factor, the overall debris-flow hazard at a particular watershed may be assessed. The applicability of the proposed approach for analyzing the watershed of the Chen-Yu-Lan River has been confirmed with the field observations in a recent typhoon event.

Keywords: Debris Flow, Watershed, Geographic Information System, Hazard Assessment

? Coles, C.A. and Yong, R.N. (2006), Use of equilibrium and initial metal concentrations in determining Freundlich isotherms for soils and sediments. *Engineering Geology*, **85** (1-2), 19-25.

Full Text: [2006\Eng Geo85, 19.pdf](2006/Eng%20Geo85,%2019.pdf)

Abstract: Batch equilibrium test results of Pb and Cd retention by kaolinite, humic acid and mackinawite and mixtures of these soil/sediment materials are modeled using Freundlich isotherms with the retained metal plotted as a function of the equilibrium metal concentration, C-e and as a function of the initial metal concentration, C-i. When C-i rather than C-e is used, smaller values of K-F and larger values of 1/n are obtained and this means the isotherm is more linear. There is no significant difference in goodness of fit for the two types of isotherms based on the coefficient of determination, r(2) and a normalized deviation, Delta q. Advantages in using C-i are that no data points need to be excluded when metal is completely retained by the adsorbent and it is easier to compare the same range of metal concentrations on one graph. A unified sorption variable K-u is evaluated for each isotherm. Since K-u represents the changing slope of the Freundlich isotherm, the value of C-i or C-e needs to be specified with the value of K-u. A dimensionless form of K-u was developed so as to permit more universal application of this parameter and K-u could potentially be used in transport prediction models. r(2) and Delta q together were better able to quantify goodness of fit of the data with the Freundlich isotherm than either of the two parameters separately. (C) 2006 Elsevier B.V. All rights reserved.

Keywords: Freundlich Isotherm, Dimensionless Unified Sorption Variable, Initial Metal Concentration, Transport Prediciton Models, Goodness of Fit, Phenolic-Compounds, Sorption, Retention, Peat, Lead

# Title: Eng. Rev.

Full Journal Title: Eng. Rev.

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JCR Abbreviated Title:

ISSN:

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Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Rađenović, A., Štrkalj, A. and Malina, J. (2009), Svojstva kemijski aktivirane ugljične anodne prašine properties of the chemically activated carbon anode dust. *Eng. Rev.*, **29** (2), 13-20.

Full Text: [2009\Eng Rev29, 13.pdf](2009/Eng%20Rev29,%2013.pdf)

# Title: Engineering Structures

Full Journal Title: [Engineering Structures](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5715&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=d637884f59e32c636265940ba0609f22)

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Journal Country/Territory: England

Language: English

Publisher: Elsevier Sci Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, Oxon, England

Subject Categories:

Engineering, Civil: Impact Factor

Tezcan, S.S. and Ipek, M. (1996), A reconnaissance report: 1995 Dinar, Turkey, earthquake. *Engineering Structures*, **18** (12), 906-916.

Full Text: [E\Eng Str18, 906.pdf](E/Eng%20Str18,%20906.pdf)

Abstract: During the 1st October 1995 Dinar, Turkey, earthquake, a total of 90 people died and about 240 people were injured. The number of collapsed or heavily damaged buildings exceeded 8000 within a radius of 20 km around the epicentre. The ground rupture was about 11 km long along an unexpected, new fault line. The reinforced concrete moment resisting framed structures as well as brick masonry houses experienced the most severe damage, especially those situated on soft soil layers of alluvium formations.

# Title: English Literature in Transition 1880-1920

Full Journal Title: [English Literature in Transition 1880-1920](http://muse.jhu.edu/journals/english_literature_in_transition/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0013-8339

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Guy, J.M. (1998), Self-plagiarism, creativity and craftsmanship in Oscar Wilde. *English Literature in Transition 1880-1920*, **41** (1), 6-23.

Full Text: [1998\Eng Lit Tra41, 6.pdf](1998/Eng%20Lit%20Tra41,%206.pdf)

# Title: English for Specific Purposes

Full Journal Title: [English for Specific Purposes](http://www.sciencedirect.com/science?_ob=PublicationURL&_tockey=%23TOC%235986%232010%23999709998%231558254%23FLA%23&_cdi=5986&_pubType=J&_auth=y&_acct=C000051951&_version=1&_urlVersion=0&_userid=1196840&md5=1d0c92b2114299c3c3ad0743131189d4)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

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Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Soler, V. (2007), Writing titles in science: An exploratory study. *English for Specific Purposes*, **26** (1), 90-102.

Full Text: [2007\Eng Spe Pur26, 90.pdf](2007/Eng%20Spe%20Pur26,%2090.pdf)

Abstract: To prevent a paper from being discarded and ensure that it addresses the right audience, it must have a proper title that satisfies certain requirements. Writing the titles to scientific articles is therefore a challenging exercise that demands the use of various skills. Still, although the research paper is one of the most thoroughly studied scientific genres, the study of research paper titles does not share the same privilege, nor does the study of review paper titles. The purpose of this research and discussion note (RD) is to examine the most recurrent structural constructions of titles in two different genres, namely, review papers (RVP) and research papers (RP) in two fields: biological sciences and social sciences. More specifically, the questions raised are, on the one hand, whether the structural construction of titles is a key distinctive feature between RP titles and RVP titles, and, on the other, whether the inherent peculiarities of scientific disciplines imprint differences on the structural constructions of RP and RVP titles. Our RD was based on a corpus of 570 titles, of which 480 were RP titles and the remaining 90 were RVP titles, all covering the period 1996-2002. Words per title were firstly counted to measure their length and all structural constructions detected, namely, nominal, question, compound, and full-sentence constructions, were registered. Results evidence an interesting finding regarding the full-sentence title construction which appears not only as a generic peculiarity of RPs but also as a disciplinary peculiarity of Biology RP titles. The lines of evidence registered in this RD support suggestions as to how to guide novice scientists to write titles appropriately. (c) 2006 The American University. Published by Elsevier Ltd. All rights reserved.

Keywords: Exercise, Research, Research Papers, Science

# Title: Ensenanza de las Ciencias

Full Journal Title: Ensenanza de las Ciencias

ISO Abbreviated Title:

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Publisher Address:

Subject Categories:

: Impact Factor

? Maz, A., Torralbo, M., Vallejo, M., Fernandez-Cano, A. and Rico, L. (2009), Mathematics education in the *Ensenanza de las Ciencias* Journal: 1983-2006. *Ensenanza de las Ciencias*, **27** (2), 185-193.

Abstract: We present a scientometric study of mathematics education papers published in the Ensenanza de las Ciencias journal between 1983 and 2006. It shows bibliographical tendencies, as well as the most prolific authors and the most relevant journals.

Keywords: *Ensenanza de las Ciencias* Journal, Mathematics Education, Scientometrics

# Title: Entrepreneurship Theory and Practice

Full Journal Title: [Entrepreneurship Theory and Practice](http://www.blackwell-synergy.com/loi/etap)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Gartner, W.B., Davidsson, P. and Zahra, S.A. (2006), Are you talking to me? The nature of community in entrepreneurship scholarship. *Entrepreneurship Theory and Practice*, **30** (3), 321-331.

Full Text: [2006\Ent The Pra30, 321.pdf](2006/Ent%20The%20Pra30,%20321.pdf)

Abstract: This special issue is devoted to understanding the scientific structure of entrepreneurship research. Research in entrepreneurship has grown rapidly, encompassing multiple theoretical and methodological traditions. Articles in this issue use bibliometric techniques to find linkages among published entrepreneurship scholars. These analyses show that research in the entrepreneurship field contains: multiple but disconnected themes; dominant themes that reflect the disciplinary training and lens of their authors; and considerable dynamism and change in key research themes over time. These special issue articles provide rich opportunities for identifying insightful, influential, and creative research niches in the entrepreneurship field.

Keywords: Articles, Authors, Bibliometrics, Citation Analysis, Community, Economics, Field, Intellectual Structure, Journal Cocitation Analysis, Key, Research, Science, Search, Structure, Techniques, Training

? Cornelius, B., Landstrom, H. and Persson, O. (2006), Entrepreneurial studies: The dynamic research front of a developing social science. *Entrepreneurship Theory and Practice*, **30** (3), 375-398.

Full Text: [2006\Ent The Pra30, 375.pdf](2006/Ent%20The%20Pra30,%20375.pdf)

Abstract: Entrepreneurship research has been built upon a historical foundation grounded in economic change. To understand the development of the field, it is useful to understand the motivations and interests of key scholars and to trace the linkages between these scholars and other authors, from the transient to the contributor. This has been done through a bibliometric analysis of research articles cited between 1982 and 2004. Entrepreneurship has developed from a subdiscipline of management studies reliant on alien terms and cognitive methods toward a separate field with increasing complexities of its own. While not fully mature, entrepreneurship shows all the signs of a maturing field from its increasingly internal orientation and the establishment of key areas of research through to an enhanced, discipline-specific, theoretical approach with a professional language of its own.

Keywords: Analysis, Bibliometric Analysis, Development, Economic, Front, Historical, Key, Language, Management, Methods, Orientation, Research, Research Articles, Research Front, Science, Social

? Schildt, H.A., Zahra, S.A. and Sillanpaa, A. (2006), Scholarly communities in entrepreneurship research: A co-citation analysis. *Entrepreneurship Theory and Practice*, **30** (3), 399-415.

Full Text: [2006\Ent The Pra30, 399.pdf](2006/Ent%20The%20Pra30,%20399.pdf)

Abstract: A debate persists about the distinctiveness of entrepreneurship research. Entrepreneurship research is seen as fragmented and its results are considered noncumulative, handicapping the evolution of the field as a respected scholarly discipline. In this article we conduct a bibliometric analysis to shed light on these issues. We analyze co-citation patterns of entrepreneurship-related articles published in the years 2000 to 2004 and identify the 25 most central research streams in entrepreneurship. We describe these groups and investigate their mutual relationships. Although the United States represents by far the greatest source of entrepreneurship articles, other countries represent significant sources of research in specific streams.

Keywords: Analysis, Bibliometric Analysis, Communities, Context, Creation, Entry, Evolution, Groups, Innovation, Knowledge, Light, Organizations, Research, Source, Sources, Streams, United States, Venture Performance

# Title: Enterprise and Innovation Management Studies

Full Journal Title: [Enterprise and Innovation Management Studies](http://weblinks2.epnet.com/authHjafDetail.asp?tb=1&_ua=bo+B%5F+db+buhjnh+bt+TD++%22B8J%22+E85E&_ug=sid+4F63F1D4%2DED2B%2D45F9%2DA929%2D8C139C472F0A%40sessionmgr2+dbs+buh+5EB7&_us=sm+ES+E6C7&_uso=st%5B0+%2DTD++%22B8J%22+tg%5B0+%2D+db%5B0+%2Dbuh+op%5B0+%2D+h)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Assoc Advancement Entomology, Trivandrum

Publisher Address:

Subject Categories:

: Impact Factor

? Bartzokas, A.. (2001), Policy relevance and theory development in innovation studies. *Enterprise and Innovation Management Studies*, **2** (1), 1-18.

Full Text: [2001\Ent Inn Man Stu2, 1.pdf](2001/Ent%20Inn%20Man%20Stu2,%201.pdf)

Abstract: The challenge of innovation and technological change to traditional methods in economics and other social sciences has been a fertile research programme with a broad and diverse collection of theories and empirical research projects, including evolutionary economics and studies of national, regional and sectoral aspects of national systems of innovation. This paper presents a brief review of the evolution of ideas of the economics of technological change in the broad area of industrial structure, innovation dynamics and economic performance. Our emphasis is on contributions which might have policy relevance when it comes to the design and implementation of innovation-related policy. This review provides the general context for the discussion of some of the research findings of the European Commission Targeted Socio-Economic Research (TSER) Programme in the area of national systems of innovation. Finally, the paper explores a number of directions for further work in the area of innovation-related policy oriented research.

Keywords: Innovation Policy Innovation Studies Technological Change

# Title: Entomon

Full Journal Title: Entomon

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0377-9335

Issues/Year:

Journal Country/Territory:

Language:

Publisher: Assoc Advancement Entomology, Trivandrum

Publisher Address:

Subject Categories:

: Impact Factor

? Moorthy, P.N.K. and Tewari, G.C. (1987), Management of stemfly Ophiomyia-phaseoli Tryon on french beans with reduced insecticidal doses. *Entomon*, **12** (4), 363-366.

# Title: Entropy

Full Journal Title: Entropy

ISO Abbreviated Title: Entropy

JCR Abbreviated Title: Entropy

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Leydesdorff, L. (2008), Configurational information as potentially negative entropy: The Triple Helix Model. *Entropy*, **10** (4), 391-410.

Full Text: [2008\Entropy10, 391.pdf](2008/Entropy10,%20391.pdf)

Abstract: Configurational information is generated when three or more sources of variance interact. The variations not only disturb each other relationally, but by selecting upon each other, they are also positioned in a configuration. A configuration can be stabilized and/or globalized. Different stabilizations can be considered as second-order variation, and globalization as a second-order selection. The positive manifestations and the negative selections operate upon one another by adding and reducing uncertainty, respectively. Reduction of uncertainty in a configuration can be measured in bits of information. The variables can also be considered as dimensions of the probabilistic entropy in the system(s) under study. The configurational information then provides us with a measure of synergy within a complex system. For example, the knowledge base of an economy can be considered as such a synergy in the otherwise virtual (that is, fourth) dimension of a regime.

Keywords: Anticipation, Communication, Configuration, Dynamics, Economy, Emergence, Entropy, Globalization, Industry-Government Relations, Information, Information Theory, Innovation Systems, Knowledge, Knowledge Base, Knowledge-Base, Mathematical-Theory, Measure, Model, Organization, Probabilistic Entropy, Reduction, Scientometrics, Second Order, Second-Order, Selection, Sources, Synergy, Terms, Transmission, Triple Helix, Uncertainty, University-Industry-Government Relations, Variables

# Title: Environment

Full Journal Title: Environment

ISO Abbreviated Title: Environment

JCR Abbreviated Title: Environment

ISSN: 0013-9157

Issues/Year: 10

Journal Country/Territory: United States

Language: English

Publisher: Heldref Publications

Publisher Address: 1319 Eighteenth St NW, Washington, DC 20036-1802

Subject Categories:

Environmental Sciences: Impact Factor

# Title: Environment and Behavior

Full Journal Title: [Environment and Behavior](http://eab.sagepub.com/), [Environment and Behavior](http://infotrac.galegroup.com/itw/infomark/0/1/1/purl=rc18_EAIM_0__jn+%22Environment+and+Behavior%22?sw_aep=jrycal5), [Environment and Behavior](http://galenet.galegroup.com/servlet/IOURL;jsessionid=860FE8889A7A9E9C22F5C8050DB7A941?issn=0013-9165&title=Environment+and+Behavior&locID=jrycal5&prod=HWRC), [Environment and Behavior](http://pao.chadwyck.co.uk/journals/displayItemFromId.do?QueryType=journals&ItemID=f117), [Environment and Behavior](http://uk1.csa.com/ids70/browse_toc.php?SID=0757592a5d1c25a5a16eef13b95326f7&db=sagepsyc-set-c&docid=sage-set-c%2FEAB_2006_38_1repl3_cln3.wais+0+sagepsyc-set-c), [Environment and Behavior](http://eab.sagepub.com/), [Environment and Behavior](http://www.swetswise.com/eAccess/viewTitleIssues.do?titleID=68433)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0167-188X

Issues/Year: 0013-9165

Journal Country/Territory:

Language:

Publisher: Elsevier Science BV, Amsterdam

Publisher Address:

Subject Categories:

: Impact Factor

? Lena, M.M.Y.L. (1997), Scientific productivity in environmental psychology in Mexico: A bibliometric analysis. *Environment and Behavior*, **29** (2), 169-197.

Full Text: [1997\Env Beh29, 169.pdf](1997/Env%20Beh29,%20169.pdf)

Abstract: To determine the characteristics of scientific productivity generated within the field of environmental psychology in Mexico, a bibliometric analysis of 143 documents produced in the area from 1960 to 1996 was carried out. The results show a pronounced tendency to generate theoretical-descriptive work and to use adults as study groups. It is argued that it is necessary to develop more research in the area, taking into account more vulnerable groups like the elderly and children. Actions taken and aimed at the strengthening of a communication network for Iberian and Latin American specialists are also described. Finally emphasis is placed on the convenience of continuing to generate bibliometric, informetric, and scientiometric research showing research trends in environmental psychology.

# Title: Environment, Development and Sustainability

Full Journal Title: [Environment, Development and Sustainability](http://www.springerlink.com/content/102874/?p=5405190c4ff64a2a93bd94c6b5aa7a79&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1387-585X

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Schubert, A. and Láng, I. (2005), The literature aftermath of the Brundtland Report ‘Our Common Future’. A scientometric study based on citations in science and social science journals. *Environment, Development and Sustainability*, **7** (1), 1-8.

Full Text: [2005\Env Dev Sus7, 1.pdf](2005/Env%20Dev%20Sus7,%201.pdf)

Abstract: Two major multidisciplinary bibliographic databases, the Science Citation Index and the Social Science Citation Index were searched to collect science and social science journal articles published in the 1987-2001 period with the report ‘Our Common Future’ among their references. A statistical overview is given about the trends and patterns revealed by the bibliometric/scientometric analysis of the retrieved literature. National and regional distributions as well as publication channels and thematic features are considered, During the period under study, the word ‘sustainability’ became the dominating term of the field, and operative questions like those of management, technology and urbanization came into the forefront of interest.

Keywords: Analysis, Bibliographic Databases, Citations, Databases, Field, Journal, Journal Articles, Journals, Literature, Management, Multidisciplinary, Operative, Publication, Regional, Science, Science Citation Index, Science Journals, Scientometric, Social, Social Science Citation Index, Sustainability, Technology, Term, Trends, Urbanization

? Sun, J.S., Ni, J.R. and Ho, Y.S. (2011), Scientometric analysis of coastal eutrophication research during the period of 1993 to 2008. *Environment, Development and Sustainability*, **13** (2), 353-366.

Full Text: [2011\Env Dev Sus13, 353.pdf](2011/Env%20Dev%20Sus13,%20353.pdf); [2011\Env Dev Sus-Sun.pdf](2011/Env%20Dev%20Sus-Sun.pdf)

Abstract: No studies were reported on the field of coastal eutrophication research by using bibliometrics. The objective of this study was to evaluate the coastal eutrophication research performance based on all the related articles in Science Citation Index (SCI) databases from 1993 to 2008. Document type, publication output, authorship, keywords, publication pattern, country and institute of publication were analyzed. The USA contributed 35.0% of total articles where the ten major industrial countries accounted for the majority of the total production. An indicator citation per publication (CPP) was presented in this study to evaluate the impact of number of authors, institutes, countries, and journals. The mean value of citation per publication of collaborative papers was higher than that of single country or institute publications. Collaboration trend was towards multi-authors, multi-institutes and multi-countries papers. This was coincident with the research trends of coastal eutrophication, which was thought to be a component of global change. Additionally, keywords analysis was used to indicate the formation and shift of hot research.

Keywords: Coastal Eutrophication, Web of Science, Bibliometric, Research Performance, Research Trend

# Title: Environment International

Full Journal Title: [Environment International](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5854&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=7a339d9b5cb7293f8e7e6817aa64a948)

ISO Abbreviated Title: Environ. Int.

JCR Abbreviated Title: Environ Int

ISSN: 0160-4120

Issues/Year: 6

Journal Country/Territory: United States

Language: English

Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Environmental Sciences: Impact Factor 0.717, 68/126 (1999), Impact Factor 0.531, 85/127 (2000)

Hódi, M., Polyák, K. and Hlavay, J. (1995), Removal of pollutants from drinking-water by combined ion-exchange and adsorption methods. *Environment International*, **21** (3), 325-331.

Full Text: [E\Env Int21, 325.pdf](E/Env%20Int21,%20325.pdf)

Abstract: Complex ion exchange and adsorption methods were used for drinking water purification. Na-clinoptilolite was applied for selective removal of ammonium ions. The ion exchange capacity was 0.47 mg NH4+/g, and 0.2 mg NH4+/L breakthrough concentration was kept. The spent clinoptilolite was regenerated by 10-20 BV of 20 g NaCl/L at pH >12, then backwashed with purified water. Granulated activated carbon was used for removal of humic acids. The adsorption capacity was 91 mg/g of adsorbent. The average effluent concentration was <1 mg of humic acid/L. New adsorbent was used for arsenic removal, prepared by precipitation of Fe(OH)3 on Al2O3 as support material. The breakthrough capacity at 0.05 mg As/L was 0.10 mg of As/g adsorbent. For the regeneration of the spent adsorbent, 15-30 BV of a 1 M NaOH solution was used. The results showed that the removal of ammonium and arsenic ions as well as humic acids was selective and was not affected by other components of the raw water.

Khordagui, H.K. (1995), Fate and control of nerve chemical warfare agents in the desalination industry of the arabian-persian gulf. *Environment International*, **21** (4), 363-379.

Full Text: [E\Env Int21, 363.pdf](E/Env%20Int21,%20363.pdf)

Abstract: This paper assesses the impact of chemical warfare agents (CWAs) on drinking water. The study is focussed on the Arabian-Persian Gulf(APG) and the desalination process. Contamination of seawater with nerve CWAs can be naturally alleviated by degradation mainly through hydrolysis. Hydrolysis is a relatively fast pathway as compared to other processes such as biodegradation and photooxidation. From the review of the open literature and based on the marine environmental conditions in the A.P.G., the following projections are made: 1) Hydrolysis will affect the soluble fraction of nerve CWAs only, 2) the rate of degradation of insoluble agent is determined by the transport phenomena and the available contact surface between the two phases (water/CWA), 3) higher temperature will promote degradation of nerve CWAs by increasing their solubilities and by accelerating their hydrolysis reactions, and 4) higher pH and divalent metal content (Cu, Ca, and Mg) in the A.P.G. will promote the hydrolysis of nerve CWAs. In general, all the environmental factors involved in the aquatic degradation of nerve CWAs in the A.P.G. marine favor the fast degradation process. In case of massive releases of nerve CWAs near the A.P.G, western shorelines, turbulence resulting from tidal cycles will affect the dissolution process and extend the toxicity of the insoluble agent. However, this phenomenon will lead to a faster elimination of the toxic substance from the aquatic environment. The time needed for the transport of the soluble fraction of the agent from the point of release to the intakes of desalination plants should be calculated to estimate the likely residual levels of toxic non-hydrolyzed fractions of the agent. Post-and pre-chlorination during the course of seawater desalination will catalyze and significantly accelerate the hydrolysis processes of the nerve CWAs. The heat exerted on CWAs during the power generation-desalination processes is not expected to thermally decompose them. However, the steam heat will augment the agents’ rate of hydrolysis with subsequent acceleration in their rate of detoxification. Available data indicate that breakthrough of nerve agents into the thermally desalinated water is conceivable and that their remnants can pose a serious life threat to consumers. Conventional pretreatment of feed seawater for RO desalination is theoretically capable of reducing the concentration of nerve CWAs by coprecipitation and adsorption on flocs formed during coagulation. Prechlorination and prolonged detention time in pretreatment units will simultaneously promote hydrolysis reactions. However, nerve CWAs can breakthrough RO tight membranes into the permeate at levels higher than the accepted tolerance posing a potential life threat to the public. Suggested control measures include boosting of pre-and post-chlorination doses, discarding the yield collected from the first stage in MSF, applying high doses of activated carbon, extending detention time, and utilizing water treatment devices at point of use or boiling the water by consumers.

Wey, M.Y. and Fang, T.J. (1995), The effect of organic and inorganic chlorides on the formation of HCl with various hydrogen-containing sources in a fluidized-bed incinerator. *Environment International*, **21** (4), 423-431.

Full Text: [E\Env Int21, 423.pdf](E/Env%20Int21,%20423.pdf)

Abstract A laboratory scale fluidized bed incinerator was used to examine the hydrogen chloride formation resulting from the presence of organic and inorganic chlorides. Polyvinyl chloride, PVC) and NaCl were used as organic and inorganic chlorides respectively. In order to check the level of HCl generated, additives (sawdust and water) were used to offer the Hydrogen containing source needed for HCl formation. Various operating conditions (temperature in sand bed and freeboard) ware also studied to characterize the potential of HCl emission. The amount of HCl generated from NaCl and PVC was found to be quite different under various operating conditions and additives.

Lee, W.M.G. and Chen, J.C. (1995), Partitioning coefficients of polycyclic aromatic-hydrocarbons in stack gas from a municipal incinerator. *Environment International*, **21** (6), 827-831.

Full Text: [E\Env Int21, 827.pdf](E/Env%20Int21,%20827.pdf)

Abstract: In this study, solid-gas partitioning coefficients of PAHs on fly ash in stack gas from a municipal incinerator were determined according to elution analysis with gas-solid chromatography. The fly ash from the electrostatic precipitator was sieved and packed into a 1/4 inch (6.3 mm) pyrex column. Elution analysis with gas-solid chromatography was conducted for three PAHs, Napthalene, Anthracene, and Pyrene. The temperature for elution analysis was in the range of 100°C to 300°C. V-g, specific retention volume obtained from elution analysis, and S, specific surface area of fly ash measured by a surface area measurement instrument, were used to estimate the solid-gas partitioning coefficient, K-R. In addition, the relationships between K-R and temperature and K-R and PAH concentrations were investigated.

Chui, V.W.D., Mok, K.W., Ng, C.Y., Luong, B.P. and Ma, K.K. (1996), Removal and recovery of copper(II), chromium(III), and nickel(II) from solutions using crude shrimp chitin packed in small columns. *Environment International*, **22** (4), 463-468.

Full Text: [E\Env Int22, 463.pdf](E/Env%20Int22,%20463.pdf)

Abstract: Shrimp shell wastes from Penaeus marginatus were demineralized by dilute hydrochloric acid in small columns to yield shrimp chitin, without removal of proteins. Ninety-six percent of calcium was efficiently removed by this column method. The two biosorbents, prepared shrimp chitin and purchased crab chitosan, were tested for their copper (Cu)(II), chromium (Cr)(III), and nickel (Ni)(II) removal and recovery efficiencies from aqueous metal solutions with concentrations ranging from 20-100 mg/L. The shrimp chitin demonstrated remarkable Cu(II) and Cr(III) collecting ability of over 95% and 96%, respectively, comparable to the best metal chelating biopolymer chitosan, whose Cu(II) and Cr(III) removal abilities under the same conditions were over 98% and 93%, respectively. However, the Ni(II) removal efficiencies of shrimp chitin were lower (44-70%) than those of crab chitosan (82-99%). Likewise, the recovery efficiencies of shrimp chitin for Ni(II) were lower (80-98%) than those of crab chitosan (83-100%). Cu(II) and Cr(III) ion recovery percentages by 0.1M EDTA for shrimp chitin were significantly higher than those of crab chitosan, although the recovery percentages of Cr(III) were low for both biosorbents and need further investigation. A preliminary test on the collecting ability of shrimp chitin on Cu(II) present in electroplating baths rinsing waters gave encouraging results. The shrimp chitin removed 92-96% Cu(II) from copper pyrophosphate and acid copper bath rinsing water.

Keywords: Chitosan, Water, Ions

Frimmel, F.H. and Huber, L. (1996), Influence of humic substances on the aquatic adsorption of heavy metals on defined mineral phases. *Environment International*, **22** (5), 507-517.

Full Text: [E\Env Int22, 507.pdf](E/Env%20Int22,%20507.pdf)

Abstract: The distribution of heavy metals in the aqueous phase of aquifers is strongly dependent on the kind of solid phase and on the presence of dissolved organic matter. Batch experiments were performed to investigate the phase distribution of Cd, Pb, and Cu using Quartz, Potassium Feldspar, Sodium Feldspar, Kaolinite, Calcite, and Fe/Mn-coated Quartz sand as mineral phases. Natural organic matter (NOM) from a brown water lake was used to study its influence on the phase distribution of the metals. From the experimental results, Freundlich isotherms were calculated. They turned out to be suited for a description of the heterogeneous systems. Despite the obvious limitations of mechanistic interpretation, NOM increased the dissolved fraction of Cu and Pb, and decreased that of Cd.

Keywords: Sorption, Oxides, Model

Chen, P.H. (1997), Adsorption of organic compounds in water using a synthetic adsorbent. *Environment International*, **23** (1), 63-73.

Full Text: [E\Env Int23, 63.pdf](E/Env%20Int23,%2063.pdf)

Abstract: The purpose of this study was to investigate adsorption of trace organic compounds from drinking water by a synthetic resin. In the batch experiments, the treatment efficiency was nearly indiscriminate at every point selected for the resin addition. The adsorption performance could be significantly improved using a high dosage of resin, pH about 8.0, low temperature, and high initial concentration of the organic compounds. In the column experiments, the single column study indicated that the breakthrough time (BT) and volume of the resin bed increased with decreasing flow rate. In the four serial columns study, there was no pronounced relationship between the adsorption capacity of resin and treatment efficiency of organic compounds, and the mean adsorption capacity was about 1.40 gn. The column service time and treated water volumes were almost not affected by the treatment efficiency. Copyright (C) 1997 Elsevier Science Ltd.

Keywords: Activated Carbon, Resins

Lin, J.G. and Chen, S.Y. (1998), The relationship between adsorption of heavy metal and organic matter in river sediments. *Environment International*, **24** **(**3), 345-352.

Full Text: [E\Env Int24, 345.pdf](E/Env%20Int24,%20345.pdf)

Abstract: Sediment samples of eight sites in two rivers located in northern Taiwan, the Tao-Chen River and the Lau-Che River, were collected to investigate the influences of organic matter on adsorbabilities of heavy metals in dry and wet periods. A batch scale adsorption study was conducted to examine the adsorbabilities of heavy metals of sediments. In the less polluted river (Tao-Chen River), pH, organic matter, cation exchange capacity (CEC), and heavy metals of sediments were independent of the changes of the flow of the river. In contrast, they would be related to those of the more polluted river (Lau-Che River). Metal concentrations and CEC in sediments were positively correlated with organic matter content. On the other hand, there was significantly positive correlation between the adsorbabilities of heavy metals of sediments and organic matter content. The adsorbabilities of sediments to heavy metals increased in the order Zn< Pb< Cu< Cr. The amount of adsorbed Cr in sediments was much greater than that of the other metals, and Znwas adsorbed much less than others.

Ugurlu, A. and Salman, B. (1998), Phosphorus removal by fly ash. *Environment International*, **24** (8), 911-918.

Full Text: [E\Env Int24, 911.pdf](E/Env%20Int24,%20911.pdf)

Abstract: The aim of this work was to investigate the possible use of fly ash generated from thermic power stations in the removal of phosphorus contained in aqueous solutions. A series of batch tests were conducted and the influence of temperature, phosphate concentration, and fly ash dosage on phosphate removal were investigated. The effect of adsorption dosage was not significant at any temperature applied. Phosphate removal in excess of 99% was obtained in these studies. Maximum removals were achieved at 40°C. The tests were also carried out on a continuous basis in an adsorption column. It was found that fly ash is an efficient adsorbent for phosphate removal. This was expected due to the high concentration of calcite present in the fly ash (338 g/kg). The phosphate removal decreased to 80.4% at the end of 72 h. (C) 1998 Elsevier Science Ltd.

Keywords: Phosphate Adsorption, Aqueous-Solutions, Waste-Water, Variables, Tnsac

Nsanze, H., Babarinde, Z. and Al Kohaly, H. (1999), Microbiological quality of bottled drinking water in the UAE and the effect of storage at different temperatures. *Environment International*, **25** (1), 53-57.

Full Text: [E\Env Int25, 53.pdf](E/Env%20Int25,%2053.pdf)

Abstract: The microbiological quality of bottled water from different sources in the United Arab Emirates was studied. The study was done on 80 commercial bottled water samples from 4 different manufacturing companies. The results showed that 75% of the 20-L bottles were contaminated by 10 different species of bacteria, whereas 10 to 40% of the 1.5-L, bottles were contaminated by 2-4 types of micro-organisms. Heterotrophic bacteria and a few types of human-associated bacteria were isolated.

The most frequent organism found in all types of water was Acinetobacter lwoffii with several genospecies. Storage of water at 4°C preserved the water without microbial multiplication, whereas at 25-37°C, most microbes multiplied, and at 42°C, most contaminants were destroyed. The source of these micro-organisms and their untoward effects on the drinking water were not determined. (C) 1999 Elsevier Science Ltd.

Keywords: Mineral-Water, Bacteria, PVC

Yu, J.C. and Cheng, L.N. (1999), Speciation and distribution of trihalomethanes in the drinking water of Hong Kong. *Environment International*, **25** (5), 605-611.

Full Text: [E\Env Int25, 605.pdf](E/Env%20Int25,%20605.pdf)

Abstract: Chlorine is commonly used as a disinfectant in the drinking water treatment process. However, chlorine may react with organic precursors such as humic substances in water to form trihalomethanes (THMs). Since THMs are known carcinogens, their concentrations in water should be monitored. The aim of this research was to measure the concentrations of THMs in drinking water in the 19 districts of Hong Kong. This study also reports, for the first time, trihalomethanes-formation potential (THM-FP) of the drinking water in Hong Kong. While the THM-FP values measured are all below the WHO guideline values, the total concentrations of THMs in tap water samples from 4 out of the 19 districts exceed the U.S. and U.K, standards. The measurements show total THM levels of 104 µg/L, 106 µg/L, 115 µg/L, and 131 µg/L in Yuen Long, Tsuen Wan, North, and Tai Po, respectively. Such high levels of organic precursors could be an indication of the deteriorating state of the Dongjiang River in Guangdong, where over 70% of Hong Kong’s drinking water originates. (C) 1999 Elsevier Science Ltd.

Keywords: Destruction, Irradiation, Precursors, Oxidation, Organics, Costs, Nom

Centner, T.J. and Gunter, L.F. (1999), Financing the disposal of unwanted agricultural pesticides. *Environment International*, **25** (5), 635-646.

Full Text: [E\Env Int25, 635.pdf](E/Env%20Int25,%20635.pdf)

Abstract: Since the mid 1980s, it has been recognized that significant quantities of unwanted pesticides are being retained by agricultural producers in barns and other storage buildings throughout the United States. U.S. state governments have responded to the hazards posed by these pesticides by implementing programs to collect and dispose of them. This paper reviews issues related to costs and funding of pesticide collection and disposal programs. Primary and secondary information is presented on approaches of U.S. states to, and experiences with, unwanted pesticide removal. Differences in the theoretical impacts of various collection funding methods on reducing unwanted pesticide stocks, and the allocation of disposal costs are discussed. A permanent funding source, acceptance of pesticides from all small business firms, and the coordination of pesticide collections with household hazardous waste programs offer suggestions for developing an effective response to this latent environmental hazard. (C) 1999 Elsevier Science Ltd.

Chen, P.H. (1999), Removing aquatic organic substances by anion exchange resin and activated carbon. *Environment International*, **25** (5), 655-662.

Full Text: [E\Env Int25, 655.pdf](E/Env%20Int25,%20655.pdf)

Abstract: The purpose of this study was to compare the adsorption characteristics of trace organic substances (TOC) from a drinking water supply between synthetic resin and granular activated carbon (GAC). In batch experiments, the effect of dosage and pH showed that the resin is much better than GAG, and a lower temperature favors an increased capacity of resin and GAG. A comparison of four adsorption models showed that the order of square of correlation coefficient for each model on resin and GAC was the same and the order was linear, Freundlich, Langmuir, and Brunauer-Emmett-Teller (BET) from high to low. In the single-column study, resin had 1.6-6.0 times the breakthrough time of GAC and the breakthrough volumes of resin were 1.5-5.8 times that of GAG. The four serial columns study showed that the adsorption capacity for TOC by resin was 1.40 g/L and approximately up to 15 times greater than by GAG. The service time of resin was higher than that of GAC by a factor of 6-22), and the treated volumes were also 4-13 times that of GAC’s. The resin was more effective than GAC after a proper selection in a traced TOC removal. (C) 1999 Elsevier Science Ltd.

Keywords: Adsorption, Water

Meehan, C., Banat, I.M., McMullan, G., Nigam, P., Smyth, F. and Marchant, R. (2000), Decolorization of Remazol Black-B using a thermotolerant yeast, *Kluyveromyces marxianus* IMB3. *Environment International*, **26** (1-2), 75-79.

Full Text: [E\Env Int26, 75.pdf](E/Env%20Int26,%2075.pdf)

Abstract: The ability of Kluyveromyces marxianus IMB3 to decolorize Remazol Black-B dye was investigated. The effect of environmental conditions, such as pH and temperature were examined. No noticeable effects on decolorization were observed when pH varied from 3.0–5.5. Maximum colour removal, 98%, was achieved at 37°C. Little or no colour removal was detected when K. marxianus IMB3 was incubated under anaerobic conditions. Further investigation, in which decolorization was monitored under extreme temperatures and low pH (to inhibit growth) and using ten fold dense inoculum, revealed that decolorization was due to biosorption to the yeast cells and not due to a metabolic reaction.

Keywords: Bioremediation, Biosorption, Textile Dyes, Decolorization, Pollution Removal, Kluyveromyces Marxianus, Dye Decolorization By Yeast

Aziz, H.A., Othman, N., Yusuff, M.S., Basri, D.R.H., Ashaari, F.A.H., Adlan, M.N., Othman, F., Johari, M. and Perwira, M. (2001), Removal of copper from water using limestone filtration technique: Determination of mechanism of removal. *Environment International*, **26** (5-6), 395-399.

Full Text: [E\Env Int26, 395.pdf](E/Env%20Int26,%20395.pdf)

Abstract: This paper discusses heavy metal removal from wastewater by batch study and filtration technique through low-cost coarse media. Batch study has indicated that more than 90% copper (Cu) with concentration up to 50 mg/l could be removed from the solution with limestone quantity above 20 ml (equivalent to 56 g), which indicates the importance of limestone media in the removal process. This indicates that the removal of Cu is influenced by the media and not solely by the pH. Batch experiments using limestone and activated carbon indicate that both limestone and activated carbon had similar metal-removal efficiency (about 95%). Results of the laboratory-scale filtration technique using limestone particles indicated that above 90% removal of Cu was achieved at retention time of 2.31 h, surface-loading rate of 4.07 m3/m2 per day and Cu loading of 0.02 kg/m3 per day. Analyses of the limestone media after filtration indicated that adsorption and absorption processes were among the mechanisms involved in the removal processes. This study indicated that limestone can be used as an alternative to replace activated carbon. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Copper, Filtration, Heavy Metals, Limestone

Wu, P.X., Liao, Z.W., Zhang, H.F. and Guo, J.C. (2001), Adsorption of phenol on inorganic-organic pillared montmorillonite in polluted water. *Environment International*, **26** (5-6), 401-407.

Full Text: [E\Env Int26, 401.pdf](E/Env%20Int26,%20401.pdf)

Abstract: Both inorganic- and organic-pillared montmorillonites (PMts) were used to adsorb phenol to study suitable conditions for adsorption and adsorption isotherms. The adsorbing capacity of modified clays depends not only surface area, but mainly on micropore structure and surface components. After incandescing at 500 degreesC, the pillar structure and the basal interlayer spacing (1.83 nm) remained stable. Using modified PMt with surfactant can improve adsorbing capacity greatly. The PMt can be recycled, and it is a potential substance for adsorption of environmental pollutants. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Pillared Montmorillonite, Adsorption, Phenol, Industrial Wastewaters, Priority Pollutants, Clays, Removal

Robinson, T., Chandran, B. and Nigam, P. (2002), Removal of dyes from an artificial textile dye effluent by two agricultural waste residues, corncob and barley husk. *Environment International*, **28** (1-2), 29-33.

Full Text: [E\Env Int28, 29.pdf](E/Env%20Int28,%2029.pdf)

Abstract: The use of a previously untried biosorbent, barley husk, for dye removal is compared to corncob. The effectiveness of adsorption as a means of dye removal has made it an ideal alternative to other more costly treatments. This paper deals with two low-cost, renewable biosorbents, which are agroindustrial by-products, for textile dye removal. Experiments at total dye concentrations of 10, 20, 30, 40, 50, 100, 150, and 200 mg l-1 were carried out with an artificial effluent consisting of an equal mixture of five textile dyes. The effects of initial dye concentration, biosorbent particle size, dose of biosorbent, effective adsorbance, and dye removal kinetics were examined. One gram (per 100 ml) of less than or equal to 600 μm corncob was found to be effective in removing a high percentage of dyes at a rapid rate (92% in 48 h), One gram of 1× 4 turn barley husk was found to be the most effective weight and particle size combination for the removal of dyes (92% in 48 h). The results illustrate how barley husk and corncob are effective biosorbents concerning the removal of textile dyes from effluent. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Barley Husk, Corncob, Textile Dyes, Color Removal, Natural Adsorbents, Wood

? Cserhati, T., Forgacs, E. and Oros, G. (2002), Biological activity and environmental impact of anionic surfactants. *Environment International*, **28** (5), 337-348.

Full Text: [2002\Env Int28, 337.pdf](2002/Env%20Int28,%20337.pdf)

Abstract: The newest results concerning the biological activity and environmental fate of anionic surfactants are collected and critically evaluated. The chemical and physicochemical parameters related to the biological activity and the field of application are briefly discussed. Examples on the effect of anionic surfactants on the cell membranes, on the activity of enzymes, on the binding to various proteins and to other cell components and on their human toxicity are presented and the possible mode of action is elucidated. The sources of environmental pollution caused by anionic surfactants are listed and the methods developed for their removal from liquid, semiliquid and solid matrices are collected. Both the beneficial and adversary effects of anionic surfactants on the environment are reported and critically discussed. It was concluded that the role of anionic surfactants in the environment is ambiguous: they can cause serious environmental pollution with toxic effect on living organisms; otherwise, they can promote the decomposition and/or removal of other inorganic and organic pollutants from the environment. The relationship between their chemical structure, physicochemical parameters, biological activity and environmental impact is not well understood, A considerable number of data are needed for the development of new anionic surfactants and for the successful application of the existing ones to reduce the adversary and to promote beneficial effects. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Anionic Surfactants, Physicochemistry, Biological Activity, Environmental Impact, Comamonas-Terrigena N3H, Sodium Dodecyl-Sulfate, Linear Alkylbenzene Sulfonate, Bacterium Pseudomonas C12B, Polluted Riverine Sites, Nonionic Surfactants, Degrading Bacteria, Primary Biodegradation, Polyacrylamide-Gel, Marine-Environment

Tran, Y.T., Barry, D.A. and Bajracharya, K. (2002), Cadmium desorption in sand. *Environment International*, **28** (6), 493-502.

Full Text: [E\Env Int28, 493.pdf](E/Env%20Int28,%20493.pdf)

Abstract: Desorption of cadmium (Cd) from sand was studied by both batch and flow-through methods. Batch experiments were conducted at three pH values (5.5, 6.0 and 6.5). In each case, the amount of Cd desorbed was low compared with the quantity of Cd adsorbed previously. Desorption of Cd in the batch experiments can be described adequately by a Freundlich isotherm. The Freundlich isotherm coefficient, *K*f, increased with pH. Hysteresis between the sorption/desorption isotherms was observed in all batch experiments. Flow-through experiments in soil columns were conducted for the same three pH values, with the results used to determine transport and sorption/desorption parameters. Again, the desorption isotherms bore little resemblance to the corresponding adsorption isotherms. The experimental breakthrough curves were well fitted by a nonequilibrium desorption model, however the time scale of the desorption process was much larger than measured in batch experiments. This model was therefore rejected as lacking realism. A simple linear retardation (including hysteresis) model that utilises different isotherms was found to simulate column breakthrough curves well. The Freundlich isotherm coefficients, *K*f, in all batch and flow-through desorption experiments were different to values evaluated from the corresponding adsorption experiments. However, in contrast to adsorption, desorption in flow-through experiments was not noticeably affected by changes in pH. The effect of pore-water velocity on desorption was also studied at pH 6.0. No trend was established between flow velocity and the desorption coefficient.

Keywords: Adsorption, Isotherm, Hysteresis, Nonequilibrium, Modelling, Freundlich, Transport

Notes: highly cited

? Malik, A. (2004), Metal bioremediation through growing cells. *Environment International*, **30** (2), 261-278.

Full Text: [2004\Env Int30, 261.pdf](2004/Env%20Int30,%20261.pdf)

Abstract: Heavy-metal pollution represents an important environmental problem due to the toxic effects of metals, and their accumulation throughout the food chain leads to serious ecological and health problems. Metal remediation through common physico-chemical techniques is expensive and unsuitable in case of voluminous effluents containing complexing organic matter and low metal contamination. Biotechnological approaches that are designed to cover such niches have, therefore, received great deal of attention in the recent years. Biosorption studies involving low-cost and often dead/pretreated biomass have dominated the literature and, subsequently, extensive reviews focusing on equilibrium and kinetics of metal biosorption have also come up. However, the low binding capacity of biomass for certain recalcitrant metals such as Ni and failure to effectively remove metals from real industrial effluents due to presence of organic or inorganic ligands limit this approach. At times, when pure biosorptive metal removal is not feasible, application of a judicious consortium of growing metal-resistant cells can ensure better removal through a combination of bioprecipitation, biosorption and continuous metabolic uptake of metals after physical adsorption. Such approach may lead to simultaneous removal of toxic metals, organic loads and other inorganic impurities, as well as allow optimization through development of resistant species. However, sensitivity of living cells to extremes of pH or high metal concentration and need to furnish metabolic energy are some of the major constraints of employing growing cells for bioremediation. The efforts to meet such challenges via isolation of metal-resistant bacterial/fungal strains and exploitation of organic wastes as carbon substrates have began. Recent studies show that the strains (bacteria, yeast and fungi) isolated from contaminated sites possess excellent capability of metal scavenging. Some bacterial strains possess high tolerance to various metals and may be potential candidates for their simultaneous removal from wastes. Evidently, the stage has already been set for the application of metal-resistant growing microbial cells for metal harvesting. This review focuses on the applicability of growing bacterial/fungal/algal cells for metal removal and the efforts directed towards cell/process development to make this option technically/economically viable for the comprehensive treatment of metal-rich effluents. (C) 2003 Elsevier Ltd. All rights reserved.

Keywords: Metal, Growing Cells, Bioremediation, Metal Resistance, Rotating Biological Contactor, Thiobacillus-Ferrooxidans Biomass, Microalga Tetraselmis-Suecica, Sulfate-Reducing Bacteria, Hydrogen Uranyl Phosphate, Saccharomyces-Cerevisiae, Heavy-Metals, Pseudomonas-Aeruginosa, Aqueous-Solutions, Nickel Accumulation

? Duker, A.A., Carranza, E.J.M. and Hale, M. (2005), Arsenic geochemistry and health. *Environment International*, **31** (5), 631-641.

Full Text: [2003\Env Int31, 631.pdf](2003/Env%20Int31,%20631.pdf)

Abstract: Arsenic occurs naturally in the earth’s crust and is widely distributed in the environment. Natural mineralization and activities of microorganisms enhance arsenic mobilization in the environment but human intervention has exacerbated arsenic contamination. Although arsenic is useful for industrial, agricultural, medicinal and other purposes, it exerts a toxic effect in a variety of organisms, including humans. Arsenic exposure may not only affect and disable organs of the body, especially the skin, but may also interfere with the proper functioning of the immune system. This paper, therefore, generally highlights the toxic effects of arsenic as well as its mobilization in the natural environment and possible controls. It also briefly attempts to outline the impact of arsenic on the immune system, whose alteration could lead to viral/bacterial infections. (c) 2004 Elsevier Ltd. All rights reserved.

Keywords: Arsenic, Immune System, Anthropogenic, Microorganisms, Season, Monomethylarsonous Acid MMA(III), Acquired-Immunodeficiency-Syndrome, Atmospheric Trace-Metals, Blackfoot-Disease, Drinking-Water, Human-Papillomavirus, Phosphate-Transport, Sodium Arsenite, Heavy-Metals, Skin-Cancer

Rangsayatorn, N., Pokethitiyook, P., Upatham, E.S. and Lanza, G.R. (2004), Cadmium biosorption by cells of *Spirulina platensis* TISTR 8217 immobilized in alginate and silica gel. *Environment International*, **30** (1), 57-63.

Full Text: [E\Env Int30, 57.pdf](E/Env%20Int30,%2057.pdf)

Abstract: The biosorption of cadmium by immobilized *Spirulina platensis* on alginate gel and silica gel was studied. The maximum biosorption capacities for alginate immobilized cells and silica immobilized cells were 70.92 and 36.63 mg Cd/g biomass, respectively. Temperature did not have an influence on metal sorption, whereas an initial pH solution did. Sorption occurred in a wide pH range (pH 3–8). The highest adsorption of alginate immobilized cells was at pH 6, while silica immobilized cell adsorption was not affected at pH between 4 and 7. The immobilized cells were reused in consecutive adsorption–desorption. The results showed that immobilized cells could be repeatedly used in the sorption process up to five times.

Keywords: *Spirulina Platensis*, Cadmium, Immobilized Cell, Alginate Gel, Silica Gel, Biosorption

Notes: highly cited

Malik, A. (2004), Metal bioremediation through growing cells. *Environment International*, **30** (2), 261-278.

Full Text: [E\Env Int30, 261.pdf](E/Env%20Int30,%20261.pdf)

Abstract: Heavy-metal pollution represents an important environmental problem due to the toxic effects of metals, and their accumulation throughout the food chain leads to serious ecological and health problems. Metal remediation through common physico-chemical techniques is expensive and unsuitable in case of voluminous effluents containing complexing organic matter and low metal contamination. Biotechnological approaches that are designed to cover such niches have, therefore, received great deal of attention in the recent years. Biosorption studies involving low-cost and often dead/pretreated biomass have dominated the literature and, subsequently, extensive reviews focusing on equilibrium and kinetics of metal biosorption have also come up. However, the low binding capacity of biomass for certain recalcitrant metals such as Ni and failure to effectively remove metals from real industrial effluents due to presence of organic or inorganic ligands limit this approach. At times, when pure biosorptive metal removal is not feasible, application of a judicious consortium of growing metal-resistant cells can ensure better removal through a combination of bioprecipitation, biosorption and continuous metabolic uptake of metals after physical adsorption. Such approach may lead to simultaneous removal of toxic metals, organic loads and other inorganic impurities, as well as allow optimization through development of resistant species. However, sensitivity of living cells to extremes of pH or high metal concentration and need to furnish metabolic energy are some of the major constraints of employing growing cells for bioremediation. The efforts to meet such challenges via isolation of metal-resistant bacterial/fungal strains and exploitation of organic wastes as carbon substrates have began. Recent studies show that the strains (bacteria, yeast and fungi) isolated from contaminated sites possess excellent capability of metal scavenging. Some bacterial strains possess high tolerance to various metals and may be potential candidates for their simultaneous removal from wastes. Evidently, the stage has already been set for the application of metal-resistant growing microbial cells for metal harvesting. This review focuses on the applicability of growing bacterial/fungal/algal cells for metal removal and the efforts directed towards cell/process development to make this option technically/economically viable for the comprehensive treatment of metal-rich effluents.

Keywords: Adsorption, Aqueous-Solutions, Bioremediation, Biosorption, Carbon, Equilibrium, Growing Cells, Heavy-Metals, Hydrogen Uranyl Phosphate, Kinetics, Lead, Metal, Metal Resistance, Metals, Microalga Tetraselmis-Suecica, Nickel Accumulation, Pseudomonas-Aeruginosa, Remediation, Rotating Biological Contactor, Saccharomyces-Cerevisiae, Sulfate-Reducing Bacteria, Thiobacillus-Ferrooxidans Biomass, Toxic Metals

Dawson, A.G., Lockett, P. and Shi, S. (2004), Tsunami hazards in Europe. *Environment International*, **30** (4), 577-585.

Full Text: [E\Env Int30, 577.pdf](E/Env%20Int30,%20577.pdf)

Abstract: Tsunami represents one of the most potentially serious forms of coastal flood risk. Although much is known on the recorded history of tsunamis for given areas of the world, very little information is available on the occurrence of palaeotsunamis during prehistory. This is of fundamental importance in calculating tsunami flood risk for any given coastal area. Given sufficient information on past tsunami activity for a particular coastal area, the numerical calculation of aggregate coastal flood risk (including tsunami) for a coastal area is very difficult to estimate since one needs also to take into account the risk of a tsunami and a storm surge taking place simultaneously during a high tide. Estimates of coastal flood risk also need to consider future changes in relative sea level caused by the combined effects of global climate change and vertical movements of the lithosphere.

Keywords: Tsunami, Storm Surge, Tides, Asteroid Impacts, Relative Sea Level Change, Coastal Flood Risk

Dai, J.L., Zhang, M. and Zhu, Y.G. (2004), Adsorption and desorption of iodine by various Chinese soils: I. Iodate. *Environment International*, **30** (6), 525-530.

Full Text: [E\Env Int30, 525.pdf](E/Env%20Int30,%20525.pdf)

Abstract: In order to assess the adsorption of iodate by different soils from China, a series of batch experiments were conducted. It was found that soils rich in iron oxide had high affinity for iodate. Iodate adsorption isotherms could be well fitted with both Langmuir and Freundlich equations. Iodate adsorption by 20 different soils from China revealed that iodate adsorption was significantly correlated with soil organic matter negatively and positively with free iron oxide contents. At initial concentration of 4 mg I L-1, iodate adsorption ranged between 9 and 34 mg kg-1 soil. No correlation between iodate adsorption and cation exchange capacity and soil pH was found. For a single soil, there was a significant linear relationship between the amounts of iodate adsorbed and desorbed, but for a group of different soils, the relationship between the amounts of iodate adsorption and desorption followed a nonlinear relationship, the deviation mainly occurred at high adsorption side. The relationship between *K*d and free aluminum oxide and free iron oxide contents showed an exponential relationship for various soils with exception of the soil from Hetian in Xinjiang.

Keywords: Adsorption, Desorption, Iodine, Iodate, Soil, China

Forgacs, E., Cserháti, T. and Oros, G. (2004), Removal of synthetic dyes from wastewaters: A review. *Environment International*, **30** (7), 953-971.

Full Text: [E\Env Int30, 953.pdf](E/Env%20Int30,%20953.pdf)

Abstract: The more recent methods for the removal of synthetic dyes from waters and wastewater are complied. The various methods of removal such as adsorption on various sorbents, chemical decomposition by oxidation, photodegradation, and microbiological decoloration, employing activated sludge, pure cultures and microbe consortiums are described. The advantages and disadvantages of the various methods are discussed and their efficacies are compared. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Activated-Sludge Process, Adsorption, Anaerobic Baffled Reactor, Biodegradation, Escherichia-Coli Strain, In-Vivo Decolourization, Klebsiella-Pneumoniae RS-13, Kluyveromyces-Marxianus IMB3, Oxidation, Reactive Azo Dyes, Rotating Biological Contactor, Simulated Textile Effluent, Synthetic Dyes, Wastewater, White-Rot Fungi

? Choy, K.K.H. and McKay, G. (2005), Sorption of metal ions from aqueous solution using bone char. *Environment International*, **31** (6), 845-854.

Full Text: [2005\Env Int31, 845.pdf](2005/Env%20Int31,%20845.pdf)

Abstract: The sorption of cadmium, copper and zinc from aqueous solutions onto bone char has been studied in both single and binary multicomponent systems. Equilibrium experimental studies have been performed to determine the sorption capacity of bone char for each metal ion. The isotherm results have been analysed using single and multi-component equilibrium models. The rate of sorption of the metal ions onto bone char has been studied using an agitated batch adsorber. The concentration versus time decay curves have been measured and a number of mass transfer models have been developed and tested based on diffusion controlled sorption. The results of the equilibrium and rate studies are presented and discussed in the paper. The possible mechanisms of metal sorption are also discussed. Finally a series of fixed bed column studies have been performed and analysed using a diffusion mass transport model. The experimental results show a displacement effect for the binary metal ion breakthrough curves. (C) 2005 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, External Mass Transfer, Surface Diffusion, Metal Ions, Bone Char, Multi-Component, Fixed-Bed Adsorbers, Low-Cost Adsorbent, Activated Carbon, Waste-Water, Heavy-Metals, Mass-Transfer, Predictive Model, Diffusion-Model, Adsorption, Removal

? Chojnacka, K. (2010), Biosorption and bioaccumulation: The prospects for practical applications. *Environment International*, **36** (3), 299-307.

Full Text: [2010\Env Int36, 299.pdf](2010/Env%20Int36,%20299.pdf)

Abstract: The paper summarizes the present and future course of biosorption and bioaccumulation, as the branch of science, pointing out on their basic assumptions, philosophy and the goals. The processes are presented as new tools for separation technologies of XXI century. The paper is the discussion with the literature on the future prospects of those processes, pointing out that research should be oriented on the practical applications, in order to make technologies from the processes and also discusses other than environmental possible future applications. It presents an own point of view on these techniques, after some years of working in this very area. Biosorption and bioaccumulation, involve interactions and concentration of toxic metals or organic pollutants (e.g. dyes) in the biomass, either living (bioaccumulation) or non-living (biosorption). The processes play an important role in natural cycling of matter in the environment. The paper discusses the possibilities which offer research on pollutants-biomass interactions, pointing out that the key to elaborate an efficient method working for the nature would be to understand the mechanisms governing the processes, parameters which influence both equilibrium and kinetics, through the observation of naturally occurring phenomena. Only then we would be able to control and carry out under industrial regime, so the processes would work beneficially for the environment. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Biosorption, Bioaccumulation, Toxic Metals, Organic Pollutants, Wastewater Treatment, Waste-Water Treatment, Heavy-Metals, Aqueous-Solutions, Reactive Dye, Microbial Biosorbents, Sphaerotilus-Natans, Candida-Tropicalis, Potential Use, Copper, pH

# Title: Environment and Planning A

Full Journal Title: [Environment and Planning A](http://www.pion.co.uk/ep/ephome.html), [Environment and Planning A](http://www.envplan.com/epa/epa_current.html)

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Environmental Studies: Impact Factor 1.210, / (2000)

Geography: Impact Factor 1.210, / (2000)

? Webber, M. (1994), Enter the dragon: Lessons for australia from northeast Asia. *Environment and Planning A*, **26** (1), 71-94.

Abstract: The 1980s saw a conscious restructuring of economic life in Australia. The direction of that restructuring was derived partly from prescriptions about the virtues of free trade and government deregulation. Another influence has been the view that the economic success of Japan and the Asian ‘dragons’ is because of their adoption of free trade and liberal market regimes. In this paper, evidence from Korea and Taiwan is used to show that this interpretation is seriously flawed. The growth of the dragons was not driven by comparative advantage. Rather, the industries of the dragons were set up independently of their competitiveness, some became competitive by exporting. Industrialisation in the newly industrialised countries (NICs) exemplifies a variety of forms of local initiative by a state: how does it have the will and power to create industrial policy? The development of state policy depends on local class structures and perceptions of the global political and economic environment that nullify attempts simply to copy policy into different social and economic circumstances. The lessons of the economic success of the Northeast Asian NICs are improperly drawn in two respects: these are dirigiste, not free market, economies, and even if that intervention has been for the good it does not follow that similar policies could be applied, much less be successful, in the different place that is Australia. This is the geographic lesson: places differ, and so, therefore, must policies.

Keywords: Newly Industrializing Countries, Export Performance, Political-Economy, South-Korea, Growth, Taiwan, Trade, State, Policy, Labor

? Falah, G. (1997), Ethnic perceptual differences of housing and neighbourhood quality in mixed Arab-Jewish cities in Israel. *Environment and Planning A*, **29** (9), 1663-1674.

Abstract: Over the period of March-May 1991, 1170 Arab and Jewish households in five ethnically mixed Arab-Jewish cities in Israel were surveyed. This fieldwork has involved the delivery of two questionnaires, on the basis of which generalisation for this paper became possible. From the analysis of data pertaining to people’s assessment of life quality in their residential environment, that is housing and neighbourhood, perceptual differences between the Arab households and the Jewish households seem to vary along a scale of spatial ethnic mixing and from city to city. The Jews appear more satisfied or happy than the Arabs in general and especially at the city level, but such differences are not always statistically significant. Evidence of Less satisfied Jewish households, most notably with regard to their neighbourhood, was uncovered and was associated with the increase in the size of the Arab population in these city subareas. This evidence and that of a similar degree of ‘happiness’ (or overlapping scores) emerged once the city subarea became the scale of analysis and once areas were grouped into various ranges of ethnic mixing. Shortages of housing in Arab areas and poor service provisions from the local government seem to structure the order of Arab household basic needs and thus inform their satisfaction priorities and levels.

Keywords: Satisfaction, Urban

? Rodríguez-Pose, A. and Refolo, M.C. (2003), The link between local production systems and public and university research in Italy. *Environment and Planning A*, **35** (8), 1477-1492.

Full Text: [2003\Env Pla A, 35, 1477.pdf](2003/Env%20Pla%20A,%2035,%201477.pdf)

Abstract: Small and medium-sized firms (SMEs) are increasingly regarded as engines of innovative activity, especially in some of the most dynamic local areas in Western Europe. However, most SMEs lack the adequate resources to conduct research and development (R&D), which is traditionally considered as the main source of innovation. This apparent contradiction has induced several researchers to try to answer the question of where SMEs get their knowledge inputs. This literature, which has tended to use patents as a proxy for public research, has found that SMEs are particularly sensitive to spillovers from university and public research. In this paper the authors readdress this question by using a bibliometric indicator of public research output, instead of patents, for 100 Italian provinces during the 1990s. The results highlight that there is a strong geographical connection between the territorial concentration of SMEs and public research and that this connection is sensitive to firm size.

Keywords: Academic Research, Collective Learning-Processes, Development Spillovers, Europe, Geographic Localization, Innovation, Research-and-Development, Small Firms, Tacit Knowledge, Technology

? Todd, P.A. (2009), Ambiguity, bias, and compromise: An ABC of bibliometric-based performance indicators introduction. *Environment and Planning A*, **41** (4), 765-771.

Full Text: [2009\Env Pla A41, 765.pdf](2009/Env%20Pla%20A41,%20765.pdf)

Keywords: Authors, Bias, Citation Counts, Editors, Geography, Impact Factor, Indicators, Journals, Metrics, Performance, Performance Indicators, Publication, Quality, Science

# Title: Environment and Planning B-Planning & Design

Full Journal Title: [Environment and Planning B-Planning & Design](http://www.envplan.com/allvols.cgi?journal=B)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Leydesdorff, L. (2007), *Environment and Planning B: Planning and Design* as a journal: The interdisciplinarity of its environment and the citation impact. *Environment and Planning B-Planning & Design*, **34** (5), 826-838.

Full Text: [2007\Env Pla B-Pla Des34, 826.pdf](2007/Env%20Pla%20B-Pla%20Des34,%20826.pdf)

Abstract: The citation impact of Environment and Planning B: Planning and Design can be visualized using its citation relations with journals in its environment as the links of a network. The size of the nodes is varied in correspondence to the relative citation impact in this environment. Additionally, one can correct for the effect of within-journal ‘self’-citations. The network can be partitioned and clustered using algorithms from social network analysis. After transposing the matrix in terms of rows and columns, the citing patterns can be mapped analogously. Citing patterns reflect the activity of the community of authors who publish in the journal, while being cited indicates reception. Environment and Planning B: Planning and Design is cited across the interface between the social sciences and the natural sciences, but its authors cite almost exclusively from the domain of the Social Science Citation Index.

Keywords: Citation, Environment, Science, Science Citation Index, Sciences, Scientific Journals, Scientometrics, Specialties

# Title: Environmental Bioengineering

Full Journal Title: Environmental Bioengineering

ISO Abbreviated Title:

JCR Abbreviated Title:

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Journal Country/Territory:

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Subject Categories:

: Impact Factor

? Cho, D.H., Kim, E.Y. and Huang, Y.T. (2010), Heavy metal removal by microbial biosorbents. In Handbook of Environmental Engineering, *Environmental Bioengineering*, Eds. Wang, L.K., Tay, J.H., Tay, S.T.L. and Hung, Y.T. **11**, 375-402.

Full Text: [2010\Env Bio11, 375.pdf](2010/Env%20Bio11,%20375.pdf)

Abstract: Conventional methods for heavy metal removal are precipitation, coagulation, reduction, ion exchange, evaporation, and membrane processes. This chapter describes the use of microbial biosorbents in removing heavy metals. Environmental factors, mechanisms, and isotherms of biosorption were discussed. Biosorption kinetics includes pseudo-first-order, pseudo-second-order, and Elovich kinetics model.

Keywords: Saccharomyces-Cerevisiae, Rhodotorula-Glutinis, Pseudomonas-Aeruginosa, Fungal Biosorption, Aqueous-Solutions, Cell-Walls, Biomass, Cadmium, Ions, Lead

# Title: Environmental Chemistry

Chelsea, Lewis Pulishers, Mich.

Manahan, S.E. (1991), *Environmental Chemistry*, Chelsea, Lewis Pulishers, Mich.

# Title: Environmental Chemistry

Full Journal Title: [Environmental Chemistry](http://www.publish.csiro.au/nid/188.htm)

ISO Abbrev. Title: Environ. Chem.

JCR Abbrev. Title: Environ Chem

ISSN: 1448-2517

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Language: English

Journal Country/Territory: Australia

Publisher: Csiro Publishing

Publisher Address: 150 Oxford St, Po Box 1139, Collingwood, Victoria 3066, Australia

Subject Categories:

Chemistry, Analytical: Impact Factor 2.809, 18/70 (2007)

Environmental Sciences: Impact Factor 2.809, 22/160 (2007)

? Miretzky, P., Muñoz, C. and Carrillo-Chávez, A. (2008), Fluoride removal from aqueous solution by Ca-pretreated macrophyte biomass. *Environmental Chemistry*, **5** (1), 68-72.

Full Text: Env Che5, 68

Abstract: The use of an aquatic macrophyte biomass (Eleocharis acicularis) pretreated with Ca2+ as a low-cost natural material for the removal of fluoride from aqueous solution was studied. Batch experiments were carried out to determine fluoride sorption capacity and the efficiency of the sorption process under different pH, initial F-and macrophyte biomass doses. The experimental data showed good fitting to Langmuir and Freundlich isotherm models. The maximum F adsorption capacity was 0.110 mmol g-1 with an efficiency of 64.5% (pH 6.0; 5.0 g L-1 Ca-pretreated biomass). The binding of Ca2+ to the biomass increased the removal efficiency over 100%. The F-removal kinetics were rapid, less than 30 min, and best described by the pseudo-second order rate model. The rate constant, the initial sorption rate and the equilibrium sorption capacity were determined. These results may be useful for deprived rural population water supply schemes in Mexico and in other developing countries.

Keywords: Adsorption, Adsorption-Kinetics, Alumina, Aqueous Solution, Biomass, Biosorption, Defluoridation, Drinking-Water, Equilibrium, Fluoride, Freundlich Isotherm, Isotherm, Isotherms, Kinetics, Langmuir, Low-Cost Materials, Metals, Mexico, pH, Population, Pseudo-Second Order, Remediation, Removal, Removal Efficiency, Solution, Sorption, Water

# Title: Environmental Chemistry

Academic Press, New York and London

Moore, J.W. and Moore, E.A. (1976), *Environmental Chemistry*, Academic Press, New York, San Fancisco and London.

# Title: Environmental Chemistry

Full Journal Title: [Environmental Chemistry](http://www.publish.csiro.au/nid/188.htm)

ISO Abbrev. Title: Environ. Chem.

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Journal Country/Territory: Australia

Publisher: Csiro Publishing

Publisher Address: 150 Oxford St, Po Box 1139, Collingwood, Victoria 3066, Australia

Subject Categories:

Chemistry, Analytical: Impact Factor 1.850, 33/70 (2009)

Environmental Sciences: Impact Factor 1.850, 70/181 (2009)

Cordero, B., Lodeiro, P., Herrero, R. and Sastre de Vicente, M.E. (2004), Biosorption of cadmium by *Fucus spiralis*. *Environmental Chemistry*, **1** (3), 180-187.

Full Text: [E\Env Che1, 180.pdf](E/Env%20Che1,%20180.pdf)

Abstract. Cadmium biosorption properties of nonliving, dried brown marine macroalga Fucus spiralis from Galician coast (northwest Spain) have been investigated. The biosorption capacity of the alga strongly depends on solution pH, the uptake is almost negligible at pH ≤ 2 and reaches a plateau at around pH 4.0. Cadmium biosorption kinetics by F. spiralis is relatively fast, with 90% of total adsorption taking place in less than one hour. A pseudo second order mechanism has been proved to be able to predict the kinetic behaviour of the biosorption process. The effect of initial cadmium ion concentration, alga dose, solution pH, and temperature on the biosorption kinetics has been studied. The Langmuir, Freundlich, Langmuir–Freundlich, and Tóth isotherms were used to fit the experimental data and to find out the adsorption parameters. Acid–base properties of the alga have been studied potentiometrically in order to calculate the number of acidic groups and the apparent pK value by using Katchalsky model. The pK obtained is comparable with typical values associated to the ionization of carboxyl groups of alginates, supporting the implication of these groups in the biosorption process.

Keywords: Algae, Biosorption, Biotechnology, Cadmium

? Lodeiro, P., Herrero, R. and Sastre de Vicente, M.E. (2006), Thermodynamic and kinetic aspects on the biosorption of cadmium by low cost materials: A review. *Environmental Chemistry*, **3** (6), 400-418.

Full Text: [2006\Env Che3, 400.pdf](2006/Env%20Che3,%20400.pdf)

Abstract: Cadmium is internationally recognized as an important pollutant in the environment, and different methods for its removal from wastewaters (chemical precipitation being the most commonly used) have been reported in the literature. Those methods are in most cases oriented to situations with high concentrations of the pollutant. Thus, alternative removal and recovery methods are being considered for removing very low concentrations of cadmium. These methods are all based on biosorption, the passive adsorption and sequestration of metals by several natural materials of biological origin. In this review we have considered the biosorption of cadmium onto biomaterials from a physicochemical, thermodynamic, and kinetic perspective. The thermodynamic perspective is based on the characterization of the interactions of the binding sites of the biosorbents with cadmium species in aqueous solution. Traditionally, this approach has been quantified using different kinds of isotherms. In addition, the description is completed by taking into account electrostatic effects, and the influence of pH and ionic strength, which are associated with the negative charge developed, in most cases, by the biomaterial. The other point of view in this review is the kinetic one, which is necessary for a full physicochemical description of the sorbate - biosorbent system. Consequently, an updated description of the various approaches commonly employed in kinetic studies in biosorption has been carried out.

Keywords: Acid-Base Properties, Biosorption, Cadmium, Isotherms, Kinetics, Heavy-Metal Biosorption, Natural Organic-Matter, Acid-Base Properties, Ion-Exchange Process, Aqueous-Solutions, Waste-Water, Bone Char, Marine-Algae, Humic Substances, Proton Binding

# Title: Environmental Chemistry Letters

Full Journal Title: [Environmental Chemistry Letters](http://www.springerlink.com/content/eajt2uf5rjp19efk/)

ISO Abbreviated Title: Environ. Chem. Lett.

JCR Abbreviated Title: Environ Chem Lett

ISSN: 1610-3653

Issues/Year: 4

Journal Country/Territory: Germany

Language: English

Publisher: Springer Heidelberg

Publisher Address: Tiergartenstrasse 17, D-69121 Heidelberg, Germany

Subject Categories:

Chemistry, Multidisciplinary: Impact Factor 0.814, 71/124 (2006); Impact Factor 1.080, 60/127 (2007); Impact Factor 2.109, 40/140 (2009)

Engineering, Environmental: Impact Factor 0.814, 17/35 (2006); Impact Factor 1.080, 20/37 (2007); Impact Factor 2.109, 12/42 (2009)

Environmental Sciences: Impact Factor 0.814, 98/144 (2006); Impact Factor 1.080, 98/160 (2007); Impact Factor 2.109, 60/181 (2009)

? Ong, S.A., Toorisaka, E., Hirata, M. and Hano, T. (2005), Treatment of azo dye Orange II in a sequential anaerobic and aerobic-sequencing batch ractor system. *Environmental Chemistry Letters*, **2** (4), 203-207.

Full Text: [2005\Env Che Let2, 203.pdf](2005/Env%20Che%20Let2,%20203.pdf)

Abstract: We studied the biodegradation of Orange II in a sequential anaerobic and aerobic-sequencing batch reactor system. Granular activated carbon was used either packed into a column or added directly into the anaerobic reactor to investigate the treatment performance between the two operation conditions. We found that the circulation of mixed liquor between the anaerobic reactor and the carbon-packed column enhanced the chemical oxygen demand from 28 to 52% and Orange II removal efficiencies from 88 to 96%, under simultaneous adsorption and biodegradation process. The morphology of microbes was observed under an electron-scanning microscope.

Keywords: Activated Carbon, Activated Sludge, Azo Dye, Color Removal, Orange II, Sequencing Batch Reactor, Sludge

? Prathap, K. and Namasivayam, C. (2010), Adsorption of vanadate(V) on Fe(III)/Cr(III) hydroxide waste. *Environmental Chemistry Letters*, **8** (4), 363-371.

Full Text: [2010\Env Che Let8, 363.pdf](2010/Env%20Che%20Let8,%20363.pdf)

Abstract: Adsorption of vanadate(V) from aqueous solution onto industrial solid ‘waste’ Fe(III)/Cr(III) hydroxide was investigated. HCl treated Fe(III)/Cr(III) hydroxide was found to be more efficient for the removal of vanadate(V) compared to untreated adsorbent. The adsorption follows second-order kinetics. Langmuir and Freundlich isotherms have been studied. The Langmuir adsorption capacity (Q (0)) of the treated and untreated adsorbents was found to be 11.43 and 4.67 mg g(-1), respectively. Thermodynamic parameters showed that the adsorption process was spontaneous and endothermic in the temperature range 32-60A degrees C. Maximum adsorption was found at system pH 4.0. The adsorption mechanism was predominantly ion exchange. Effect of other anions such as phosphate, selenite, molybdate, nitrate, chloride, and sulfate on adsorption of vanadium has been examined.

Keywords: Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Mechanism, Anions, Aqueous Solution, Aqueous-Solution, Capacity, Chitosan, Chloride, Endothermic, Equilibrium, Fe(III), Cr(III) Hydroxide, Freundlich, Industrial Solid-Waste, Ion Exchange, Ion-Exchange, Iron-Oxides, Isotherms, Kinetics, Kinetics, Langmuir, Langmuir and Freundlich Isotherms, Mechanism, Molybdate, Nitrate, pH, Phosphate, Removal, Second Order, Second Order Kinetics, Second-Order, Second-Order Kinetics, Solution, Sorption, Sulfate, Temperature, Thermodynamic, Thermodynamic Parameters, Vanadate, Vanadium, Vanadium Removal, Waste, Water

? Belala, Z., Jeguirim, M., Belhachemi, M., Addoun, F. and Trouvé, G. (2011), Biosorption of copper from aqueous solutions by date stones and palm-trees waste. *Environmental Chemistry Letters*, **9** (1), 65-69.

Full Text: [2011\Env Che Let9, 65.pdf](2011/Env%20Che%20Let9,%2065.pdf)

Abstract: The removal of toxic metals from wastewaters by biosorption, based on the metal-binding capacities of various biological materials, has received much interest. However, the success of this approach depends on economic feasibility, which can be obtained by optimization of the environmental conditions. This paper evaluates, for the first time, the use of low-cost biosorbent (date stones (DS) and palm-tree waste (PTW)) to eliminate Cu(II) from aqueous solutions. The effect of some parameters on copper biosorption has been studied using date stones and palm-tree waste as solid sorbents. Results show that the highest percentage of copper adsorption was obtained for the smallest size of the sorbent particles. The biosorption process was found to occur rapidly, i.e. the maximum sorption capacity was reached within 20 min. The process involved pseudo-second-order kinetics with an activation energy value within the normal range considered for processes, where a physical interaction between the sorbate and the sorbent solid predominated. The thermodynamic parameters of the copper ions uptake onto the solid sorbents indicated that, the process was endothermic and proceeds spontaneously from the date stones. However, the thermodynamic studies of the adsorption of copper on palm-tree waste indicated that the process was exothermic and proceeds spontaneously.

Keywords: Adsorption, Biosoprtion, Biosorption, Cadmium(II), Copper, Cu(II), Date Stones, Equilibrium, Ions, Kinetics, Kinetics, Lead(II), Palm-Trees Waste, Peat, Pits, Removal, Sorption, Thermodynamics

# Title: Environmental Conservation

Full Journal Title: [Environmental Conservation](http://www.cambridge.org/uk/journals/journal_catalogue.asp?historylinks=ALPHA&mnemonic=ENC)

ISO Abbreviated Title: Environ. Conserv.

JCR Abbreviated Title: Environ Conserv

ISSN: 0376-8929

Issues/Year: 4

Journal Country/Territory: England

Language: English

Publisher: Cambridge Univ Press

Publisher Address: 40 West 20th Street, New York, NY 10011-4211

Subject Categories:

Environmental Sciences: Impact Factor 0.804, 62/126 (1999), Impact Factor 1.283, 32/127 (2000)

Morton, B. (1996), Protecting Hong Kong’s marine biodiversity: Present proposals, future challenges. *Environmental Conservation*, **23** (1), 55-65.

Full Text: 1996\Env Con23, 55.pdf

Abstract: Pollution from many sources, over-fishing and the rapid development of Hong Kong have had powerful, adverse, impacts upon local marine life reducing it to but a shadow of what it once was. This paper describes Hong Kong’s newly enacted Marine Parks Ordinance Chapter 37 1995, discusses the existing situation with regard to the designation of marine parks and reserves and describes the special features of each one. It argues that a territory-wide strategy will have to be implemented if representative intertidal and coastal water communities are to survive. Coastal zone planning and management need to be among the Hong Kong Government’s highest priorities because there are indications that the marine parks and reserves will not be successful. The threats to them are too great. Conservation legislation and coastal planning exercises should also be integrated with those of China as soon as possible, especially for areas of coastline surrounding Hong Kong. This is because development within southern China is proceeding at such a pace that Hong Kong’s protected areas are now being threatened by external factors as well as internal ones.

Notes: highly cited

? Fielding, A.H. and Bell, J.F. (1997), A review of methods for the assessment of prediction errors in conservation presence/absence models. *Environmental Conservation*, **24** (1), 38-49.

Full Text: [1997\Env Con24, 38.pdf](1997/Env%20Con24,%2038.pdf)

Abstract: Predicting the distribution of endangered species from habitat data is frequently perceived to be a useful technique. Models that predict the presence or absence of a species are normally judged by the number of prediction errors. These may be of two types: false positives and false negatives. Many of the prediction errors can be traced to ecological processes such as unsaturated habitat and species interactions. Consequently, if prediction errors are not placed in an ecological context the results of the model may be misleading. The simplest, and most widely used, measure of prediction accuracy is the number of correctly classified cases. There are other measures of prediction success that may be more appropriate. Strategies for assessing the causes and costs of these errors are discussed. A range of techniques for measuring error in presence/absence models, including some that are seldom used by ecologists (e.g. ROC plots and cost matrices), are described. A new approach to estimating prediction error, which is based on the spatial characteristics of the errors, is proposed. Thirteen recommendations are made to enable the objective selection of an error assessment technique for ecological presence/absence models.

Keywords: Accuracy, Approach, Assessing, Assessment, Associations, Autocorrelation, Birds, Characteristics, Classification, Classifier, Conservation, Context, Cost, Costs, Data, Data Partitioning, Distribution, Endangered Species, Error, Errors, Habitat, Habitat Models, Habitat Relationships, Habitat-Association Model, Mar, Measure, Methods, Model, Models, Prediction, Recommendations, Regression, Review, ROC, Selection, Spatial-Distribution, Species, Techniques, Threshold, Validation, Wildlife

? Hicks, C.C., Fitzsimmons, C. and Polunin, N.V.C. (2010), Interdisciplinarity in the environmental sciences: Barriers and frontiers. *Environmental Conservation*, **37** (4), 464-477.

Full Text: [2010\Env Con37, 464.pdf](2010/Env%20Con37,%20464.pdf)

Abstract: Global environmental changes present unprecedented challenges to humans and the ecosystems upon which they depend. The need for interdisciplinary approaches to solve such multidimensional challenges is clear, however less clear is whether current attempts to cross disciplinary boundaries are succeeding. Indeed, efforts to further interdisciplinary approaches remain hampered by failures in assessing their scope and success. Here a set of measures examined the interdisciplinarity of the environmental sciences and tested two literature-based hypotheses: (1) newer and larger disciplines are more interdisciplinary; and (2) interdisciplinary research has lower impact factors than its counterparts. In addition, network analysis was used to map interdisciplinarity and determine the relative extent to which environmental science disciplines draw on alternative disciplinary perspectives. Contrary to expectations, age and size of a discipline had no effect on measures of interdisciplinarity for papers published in 2006, though metrics indicated larger articles and journals were more interdisciplinary. In addition, interdisciplinary research had a greater impact factor than its more strictly disciplinary peers. Network analysis revealed disciplines acting as ‘interdisciplinary frontiers’, bridging critical gaps between otherwise disparate subject areas. Whilst interdisciplinarity is complex, a combination of diversity metrics and network analysis provides valuable preliminary insights for interdisciplinary environmental research policy. The successful promotion of interdisciplinarity is needed to help dispel commonly perceived barriers to interdisciplinarity and create opportunities for such work by increasing the space available for different disciplines to encounter each other. In particular, the networks presented highlight the importance of considering disciplinary functioning within the wider context, to ensure maximum benefit to the scientific community as a whole.

Keywords: Analysis, Bibliometric Indicators, Centrality, Citation Analysis, Complex, Disciplines, Environmental Sciences, Humans, Impact, Impact Factor, Impact Factors, Impact Measures, Interdisciplinarity, Interdisciplinary Research, Journals, Knowledge, Metrics, Network, Network Analysis, Networks, Promotion, Research, Science, Science Metrics, Science Policy, Sciences, Scientific Journals, Social Network Analysis, Social-Sciences, Subject Areas, Systems, Transdisciplinary Research

# Title: Environmental Earth Sciences

Full Journal Title: Environmental Earth Sciences

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Huang, L.Z., Zeng, G.M., Huang, D.L., Li, L.F., Du, C.Y. and Zhang, L. (2010), Biosorption of cadmium(II) from aqueous solution onto *Hydrilla verticillata*. *Environmental Earth Sciences*, **60** (8), 1683-1691.

Full Text: [2010\Env Ear Sci60, 1683.pdf](2010/Env%20Ear%20Sci60,%201683.pdf)

Abstract: Biosorption is an effective method to remove heavy metals from wastewater. In this work, the biosorption of Cd(II) onto Hydrilla verticillata was examined in aqueous solution with parameters of initial pH, adsorbent dosage, contact time, initial Cd(II) concentration, temperature, and co-existing ion. Linear Langmuir and Freundlich models were applied to describe the equilibrium isotherms, and both of the two models were fitted well. The monolayer adsorption capacity of Cd(II) was found to be 50 mg/g at pH 6 and 20AºC. Dubinin-Radushkevich isotherm model was also applied to the equilibrium data. The mean free energy of adsorption (11.18 kJ/mol) indicated that the adsorption of Cd(II) onto H. verticillata might be carried out via chemical ion-exchange mechanism. Thermodynamic parameters, including free energy (a dagger G (0)), enthalpy (a dagger H (0)), and entropy (a dagger S (0)) of adsorption, were also calculated. These results showed that the biosorption of Cd(II) onto H. verticillata was a feasible, spontaneous, and exothermic process in nature. Desorption experiments indicated that 0.01 mol/L EDTA and HNO3 were efficient desorbents for the recovery of Cd(II) from biomass. IR spectrum analysis suggested that amido, hydroxyl, C=O and C-O could combine strongly with Cd(II). EDX spectrum analysis suggested that an ion exchange mechanism might be involved.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacity, Adsorption Isotherm, Analysis, Aqueous Solution, Biomass, Biosorption, Cadmium(II), Capacity, Cd(II), Chemical, Cladophora-Fascicularis, Co, Concentration, Data, Desorption, EDTA, EDX, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Isotherms, Exothermic, Experiments, Freundlich, Heavy Metals, Heavy-Metals, Hydrilla Verticillata, Ion Exchange, Ion-Exchange, Ionexchange, IR, Isotherm, Isotherm Model, Isotherms, Langmuir, Mechanism, Metal-Ions, Metals, Model, Models, Monolayer, pH, Recovery, Removal, Solution, Sorption, Spectrum Analysis, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Tree Fern, Waste-Water, Wastewater, Work

? Etci, O., Bektaş, N. and Öncel, M.S. (2010), Single and binary adsorption of lead and cadmium ions from aqueous solution using the clay mineral beidellite. *Environmental Earth Sciences*, **61** (2), 231-240.

Full Text: [2010\Env Ear Sci61, 231.pdf](2010/Env%20Ear%20Sci61,%20231.pdf)

Abstract: Beidellite, a low-cost, locally available and natural mineral was used as an adsorbent for the removal of lead and cadmium ions from aqueous solutions in batch experiments. The kinetics of adsorption process was tested for the pseudo first-order, pseudo second-order reaction and intra-particle diffusion models. The rate constants of adsorption for all these kinetic models were calculated. Comparison amongst the models showed that the sorption kinetics was best described by the pseudo second-order model. Langmuir and Freundlich isotherm models were applied to the experimental equilibrium data for different temperatures. The adsorption capacities (QA degrees) of beidellite for lead and cadmium ions were calculated from the Langmuir isotherm. It was found that adsorption capacity was in the range of 83.3-86.9 for lead and 42-45.6 mg/g for cadmium at different temperatures. Thermodynamic studies showed that the metal uptake reaction by beidellite was endothermic in nature. Binary metal adsorption studies were also conducted to investigate the interactions and competitive effects in binary adsorption process. Based on the optimum parameters found, beidellite can be used as adsorbent for metal removal processes.

Keywords: Adsorbent, Adsorption, Adsorption Isotherm, Beidellite, Cadmium, Cd(II), Competitive Adsorption, Diffusion, Equilibrium, Freundlich Isotherm, Heavy-Metal Ions, Isotherm, Kinetic, Kinetic Models, Kinetics, Langmuir, Langmuir Isotherm, Lead, Metal Sorption, Modified Kaolinite Clay, Pb(II), Removal, Sorption, Thermodynamic, Waste-Water

? Hamidpour, M., Kalbasi, M., Afyuni, M., Shariatmadari, H. and Furrer, G. (2011), Sorption of lead on Iranian bentonite and zeolite: Kinetics and isotherms. *Environmental Earth Sciences*, **62** (3), 559-568.

Full Text: [2011\Env Ear Sci62, 559.pdf](2011/Env%20Ear%20Sci62,%20559.pdf)

Abstract: This study deals with the use of the natural, low-cost sorbents bentonite and zeolite for the removal of lead from aqueous solutions. The mineral material is from large deposits of bentonite and zeolite that have been discovered recently in Iran. Experimental and modeling data from our kinetic and equilibrium investigations reveal that (1) the pseudo-second-order kinetic model gave the best fit, and (2) the Koble-Corrigan sorption model describes the interaction between Pb(II) and the two mineral materials better than the Freundlich and Langmuir models. However, the sorption of Pb(II) ions by zeolite and bentonite is complex and probably involves several mechanisms. The experimental data show that natural zeolite and bentonite used in this study exhibited a reasonable sorption capacity for Pb(II), and thus may be useful for the immobilization of Pb(II) from polluted sites.

Keywords: Adsorption, Aqueous Solutions, Aqueous-Solutions, Bentonite, Cadmium, Capacity, Clay, Clinoptilolite, Data, Equilibrium, Experimental, Freundlich, Immobilization, Interaction, Investigations, Ionic-Strength, Ions, Iran, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Lead, Low Cost, Mechanisms, Model, Modeling, Models, Montmorillonite, Natural, Natural Zeolite, Pb(II), Pb(II), Pb(II) Ions, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Solutions, Sorbents, Sorption, Sorption Capacity, Zeolite

# Title: Environmental & Engineering Geoscience

Full Journal Title: Environmental & Engineering Geoscience

ISO Abbreviated Title: Environ. Eng. Geosci.

JCR Abbreviated Title: Environ Eng Geosci

ISSN: 1078-7275

Issues/Year: 4

Journal Country/Territory: United States

Language: English

Publisher: Assoc Engineering Geologists Geological Society Amer

Publisher Address: Texas A & M Univ, Dept Geology & Geophysics, College Stn, TX 77843-3115

Subject Categories:

Engineering, Environmental: Impact Factor 0.25, / (2001)

Engineering, Geological: Impact Factor 0.25, / (2001)

Geosciences, Interdisciplinary: Impact Factor 0.25, / (2001)

Kayabali, K. (1997), The role of soil behavior on damage caused by the Dinar earthquake (Southwestern Turkey) of October 1, 1995. *Environmental & Engineering Geoscience*, **3** (1), 111-121.

Abstract: The Dinar earthquake (M-L = 6.0) took place in southwestern Turkey on October 1, 1995, and caused extensive damage to buildings in the city of Dinar, Soil liquefaction and lateral-spreading types of ground failure developed in the vicinity of Dinar, In order to investigate the possible contribution to the damage to buildings by site amplification, both the practical method of calculating the natural period of soils and site response analyses were performed, Geotechnical data from borehole records, and hypothetically assigned shear wave velocities to the soil layers were combined into the computer model SHAKE91 to compute the predominant period of the soil columns at four selected locations. The results of site response analyses indicate that the predominant periods of those locations are far beyond that of buildings in Dinar, Thus, it was concluded that the heavy damage to buildings associated with the recent earthquake is attributed largely to the use of improper material and poor design, The relatively long duration of earthquake shaking intensified the damage to the poorly constructed buildings.

# Title: Environmental & Engineering Geoscience

Full Journal Title: Environmental & Engineering Geoscience

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Bulgariu, L., Cojocaru, C., Robu, B. and Macoveanu, M. (2007), Equilibrium isotherms studies for sorption of lead ions from aqueous solutions using Romanian peat sorbent. *Environmental & Engineering Geoscience*, **6** (5), 425-430.

Full Text: [2007\Env Eng Geo6, 425.pdf](2007/Env%20Eng%20Geo6,%20425.pdf)

Abstract: In this work, the ability of Romanian peat for sorption of Pb(II) ions from aqueous solution has been determined using the batch experimental techniques. The sorption equilibrium has been studied at different pH values. The equilibrium adsorption level was determined to be dependent of the pH of solution and initial Pb(II) concentration.

The equilibrium adsorption capacity of Romanian peat sorbent for lead has been described by seven types of mathematical model isotherms, namely: Freundlich, Langmuir, Redlich-Peterson, Sips, Temkin, Toth and Dubin-Radushkevich isotherms. The thermodynamic parameters like free energy changes for adsorption of Pb(II) by Romanian peat sorbent have been computed and discussed.

Keywords: Heavy Metals, Sorption Isotherm, Wastewater, Heavy-Metal Ions, Waste-Water, Removal, Sawdust, Biosorbents, Adsorption, Copper

# Title: Environmental Engineering and Management Journal

Full Journal Title: [Environmental Engineering and Management Journal](http://omicron.ch.tuiasi.ro/EEMJ/issues.htm); [Environmental Engineering and Management Journal](http://www.ecozone.ro/index.php)

ISO Abbrev. Title: Environ. Eng. Manag. J.

JCR Abbrev. Title: Environ Eng Manag J

ISSN: 1582-9596

Issues/Year: 6

Language: English

Journal Country/Territory: Romania

Publisher: Gh Asachi Technical Univ Iasi

Publisher Address: 71 Mangeron Blvd, Iasi 700050, Romania

Subject Categories:

Environmental Sciences: Impact Factor 0.885, 143/160 (2009); Impact Factor 1.435, 107/193 (2010)

? Copcia, V.E., Pavel, C.C., Bilba, D. and Bilba, N. (2006), Evaluation of ETS-10 titanosilicate for ammoniacal nitrogen removal. *Environmental Engineering and Management Journal*, **5** (1), 1-10.

Full Text: [2006\Env Eng Man J5, 1.pdf](2006/Env%20Eng%20Man%20J5,%201.pdf)

Abstract: A series of batch experiments were conducted to ascertain the ability of titanosilicate ETS-10 to remove ammoniacal nitrogen from synthetic aqueous solutions of ammonium chloride. Ammonium uptake was favoured by neutral medium, higher initial ammonium concentration, low ionic strength of solution (absence of background electrolyte), alkali metal form of ETS-10 and high temperature. From equilibrium data, plotted as ion exchange isotherms in equivalent fractions, the apparent selectivity coefficients and the thermodynamic functions were calculated. The titanosilicate ETS-10 seemed to have good potential for ammonium removal from wastewaters.

Keywords: Ion Exchange, Ammoniacal Nitrogen, Titanosilicate, ETS-10

? Kicsi, A., Bilba, D. and Macoveanu, M. (2007), Removal of zinc(II) from aqueous solutions by Romanian spragnum peat moss. *Environmental Engineering and Management Journal*, **6** (3), 205-209.

Full Text: 2007\Env Eng Man J6, 205.pdf

Abstract: In recent years the removal of toxic substances especially heavy metals from water and wastewater by using of non-conventional low-cost sorbent (industrial wastes and some natural material including microorganisms, plant-derived materials, agricultural products and by-products, mineral oxides, clays) has received much attention. In this paper efficiency of Zn(II) removal from aqueous solutions by sorption onto Romanian sphagnum peat moss was studied in batch experiments involving process parameters such as initial solution pH, concentration of metal ions and of peat sorbent, temperature solution and phases contact time. The sorption of Zn(II) is highest at pH 5.5, increases with peat dose and solution temperature and decreases with increase of concentration of solution; the required time for equilibrium establish is of maximum 2 hours. Therefore, use of sphagnum peat moss as potential sorbent for the removal of Zn(II) can be a promising alternative in the decontamination of aqueous effluents.

Keywords: Romanian Sphagnum Peat Moss, Zinc, Sorption, Batch Experiments, Heavy-Metals, Ions, Biosorption, Adsorption, Copper, Water, Chromium, Sorption, pH

? Bulgariu, L., Cojocaru, C., Robu, B. and Macoveanu, M. (2007), Equilibrium isotherms studies for sorption of lead ions from aqueous solutions using Romanian peat sorbent. *Environmental Engineering and Management Journal*, **6** (5), 425-430.

Full Text: 2007\Env Eng Man J6, 425.pdf

Abstract: In this work, the ability of Romanian peat for sorption of Pb(II) ions from aqueous solution has been determined using the batch experimental techniques. The sorption equilibrium has been studied at different pH values. The equilibrium adsorption level was determined to be dependent of the pH of solution and initial Pb(II) concentration.

The equilibrium adsorption capacity of Romanian peat sorbent for lead has been described by seven types of mathematical model isotherms, namely: Freundlich, Langmuir, Redlich-Peterson, Sips, Temkin, Toth and Dubin-Radushkevich isotherms. The thermodynamic parameters like free energy changes for adsorption of Pb(II) by Romanian peat sorbent have been computed and discussed.

Keywords: Heavy Metals, Sorption Isotherm, Wastewater, Heavy-Metal Ions, Waste-Water, Removal, Sawdust, Biosorbents, Adsorption, Copper

? Balan, C., Biilba, D. and Macoveanu, M. (2007), Removal of cadmium(II) from aqueous solutions by sphagnum moss peat: Equilibrium study. *Environmental Engineering and Management Journal*, **7** (1), 17-23.

Full Text: 2007\Env Eng Man J7, 17.pdf

Abstract: Cadmium is listed by US-EPA as one of priority pollutant and as a known carcinogen. and therefore its removal from wastewaters of various industrial processes is a very important environmental problem. The paper analyzes the effectiveness of a Romanian sphagnum moss peat as available and cheaper sorbent in removal of Cd(II) from aqueous solutions. Batch sorption experiments were carried out in order to establish the influence of solution pH, peat dose, contact time and initial cadmium concentration on the sorption of the pollutant cation onto the sphagnum moss peat. The sorption equilibrium data were analysed by using the Freundlich and Langmuir isotherms.

Keywords: Cadmium, Sphagnum Moss Peat, Sorption, Isotherms, Heavy-Metals, Ions, Biosorption, Sorption, Adsorption, Waste, Copper, Water, Thermodynamics, Lead(II)

? Bulgariu, D., Juravle, D., Bulgariu, L., Macoveanu, M. and Rusu, C. (2008), Distribution and migration of chrome in urban soils - Case study: Iasi city (industrial zone). *Environmental Engineering and Management Journal*, **7** (3), 277-288.

Full Text: 2008\Env Eng Man J7, 277.pdf

Abstract: In this study, we follow the chrome distribution and his association forms with mineral and organic components, from 14 soil samples from industrial zone of Iasi city. The total chrome concentration in studied soil samples varied between 11.73-129.35 mu g/g, being lower than the normal values only for four samples. The Cr(VI) weight of total chrome content varied between 3.78-14.52 %. For none of studied soil samples the chrome content is not over to value of alert concentration. The quantitative ratio between Cr(III) and Cr(VI) is conditioned by the redox potential values, and the occurrence of speciation forms is conditioned by pH, concentration and specific association forms with soils components. The continuous variation of urban soils properties increases the probability of Cr(VI) accumulation as species with high toxic potential.

Keywords: Accumulation, Behavior, Chrome, Chromium(III), Cr(III), Cr(VI), Distribution, Extraction, Forms, Metals, Migration, Occurrence, Oxidation, pH, Pollution, Quantitative, Reduction, Sediments, Soil, Soils, Sorption, Speciation, Species, Urban Soil

? Caliman, F.A. and Gavrilescu, M. (2008), Sorption of cationic dyes from aqueous solution onto natural clay. Equilibrium and kinetic study. *Environmental Engineering and Management Journal*, **7** (3), 301-308.

Full Text: 2008\Env Eng Man J7, 301.pdf

Abstract: Equilibrium and kinetic studies regarding the sorption of the copper phtalocyanine dye Alcian Blue 8 GX were carried-out within batch experiments. The sorption equilibrium revealed that the pure natural clay can uptake lap to 18 mg of Alcian Blue 8 GX per 1 g mass of clay. The cationic dye sorption was best fitted by Freundlich model that is applicable to sorption on heterogeneous surfaces (surfaces with non-equivalent energetic sites). The pseudo-second order kinetic model may be efficiently used to predict the kinetic of the dye Alcian Blue 8GX sorption by the studied clay.

Keywords: Adsorption, Alcian Blue 8 GX, Aqueous Solution, Cadmium, Cationic Dye, Cationic Dyes, Clay, Copper, Dye, Dyes, Equilibrium, Experiments, Freundlich, Freundlich Model, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetic Studies, Kinetic Study, Lead, Model, Models, Natural Clay, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Sawdust, Soil, Solution, Sorption, Thermodynamics, Wood

? Bulgariu, L., Ratoi, M., Bulgariu, D. and Macoveanu, M. (2008), Equilibrium study of Pb(II) and Hg(II) Sorption from aqueous solutions by moss peat. *Environmental Engineering and Management Journal*, **7** (5), 511-516.

Full Text: [2008\Env Eng Man J7, 511.pdf](2008/Env%20Eng%20Man%20J7,%20511.pdf)

Abstract: The sorption of Pb(II) and Hg(II) ions from aqueous solutions by moss peat (from Poiana Stampei, Romania) was studied in a batch system. The data obtained from experiments of a single-component sorption were analyzed using Langmuir and Freundlich models. The Langmuir equation describe sorption isotherm of Pb(II) and Hg(II) with high correlation coefficients, and better than Freundlich model. According to the Langmuir model, the maximum uptake capacities of moss peat for Pb(II) and Hg(II) were obtained as 117.58 mg/g and 81.97 mg/g, respectively. The effect of temperature on the Pb(II) and Hg(II) sorption process onto moss peat was also investigated, and various thermodynamic parameters, such as ΔG, ΔH, ΔS and E-a have been calculated.

Keywords: Adsorbents, Aqueous, Batch System, Biosorption, Copper, Equilibrium, Equilibrium Study, Freundlich, Heavy-Metals, Hg(II), Ions, Isotherm, Langmuir, Langmuir Equation, Langmuir Model, Lead, Lead(II), Mercury(II), Model, Models, Moss, Moss Peat, Pb(II), Peat, Removal, Solutions, Sorbents, Sorption, Sorption Isotherm, System, Temperature, Thermodynamic, Thermodynamic Parameters, Waste-Water

? Apostol, L.C. and Gavrilescu, M. (2009), Application of natural materials as sorbents for persistent organic pollutants. *Environmental Engineering and Management Journal*, **8** (2), 243-252.

Full Text: 2009\Env Eng Man J8, 243.pdf

Abstract: Persistent organic pollutants (POPs) are toxic chemicals that adversely affect human health and the environment around. This group of priority pollutants consists of pesticides, industrial chemicals and unintentional by-products of industrial processes. Natural materials, waste from industry and agriculture and bioadsorbents can be employed as inexpensive adsorbents to remove POPs from environmental components by sorption processes. The paper presents various natural sorbents and some outcome of POPs sorption on these materials. There are describes sorbent characteristics and factors affecting sorption of organic pollutants by natural sorbents. It is evident from the review that natural sorbents have demonstrated high removal capabilities for certain compounds. The interest is justified by the awareness that POPs may constitute serious risks for the health of man and other living organisms.

Keywords: Activated Carbon, Adsorbents, Adsorption-Isotherm, Agriculture, Almond Shell Residues, Aqueous-Solutions, Characteristics, Chemicals, Clay-Minerals, Environment, Environmental, Health, Human, Human Health, Industrial Processes, Living, Living Organisms, Natural, Natural Material, Organic, Organic Pollutant, Organic Pollutants, Outcome, Pesticides, Phanerochaete-Chrysosporium, Pine Bark, Pollutants, Removal, Review, Risks, Sorbent, Sorbents, Sorption, Sorption, Toxic, Waste, Waste-Water

? Buburuzan, A.M., Catrinescu, C. and Macoveanu, M. (2009), Adsorption of n-hexane vapors onto non-functionalised hypercrosslinked polymers (hypersol-macronet (TM)) and activated carbon: Thermodynamic and Kinetic Studies. *Environmental Engineering and Management Journal*, **8** (2), 259-265.

Full Text: 2009\Env Eng Man J8, 259.pdf

Abstract: The adsorption characteristics of n-hexane vapors from gaseous stream onto two types of hypercrosslinked polymeric resins (MN 202 and MN 250), and a bituminous granular activated carbon (AC 20) was investigated. The n-hexane influent concentration ranged from 2100 to 4500 ppm and the adsorption processes were performed at 30, 40 and 50 C. Thermodynamic potentials ΔH, ΔS, and ΔG and isosteric heats of adsorption were calculated from experiment performed at different temperatures (30-50ºC), and at various surface loading. The isosteric heat of adsorption curves varied with the surface loading for each adsorbent indicating that the hypercrosslinked polymeric resins (MN 202 and MN 250) and granular activated carbon (AC 20) have an energetically heterogeneous surface. The negative values of ΔH, ΔS, and ΔG, for each adsorbent studied, indicate the exothermic, stable and spontaneous nature of the n-hexane vapors adsorption process. Experimental data were also fitted using two adsorption kinetics models (pseudo-first-order and pseudo-second order equations) at 4500 ppm and 40ºC. The results showed that the adsorption process of n-hexane vapors onto MN 202, MN 250, and AC 20 followed the pseudo-second-order kinetics.

Keywords: Ac20, Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Kinetics, Air, Breakthrough, Carbon, Characteristics, Concentration, Data, Equilibrium, Exothermic, Experiment, Fiber, Granular Activated Carbon, Heat of Adsorption, Hexane, Isosteric Heat of Adsorption, Kinetic, Kinetics, Kinetics Models, Loading, Mn, Mn 202, Mn 250, Models, Nanotubes, Naphthalene, Polymeric, Polystyrene, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Removal, Resins, Stream, Surface, Thermodynamic, Thermodynamics, VOCs, Volatile Organic-Compounds

? Bulgariu, L., Ratoi, M., Bulgariu, D. and Macoveanu, M. (2009), The sorption of lead(II) ions from aqueous solutions on peat: Kinetics study. *Environmental Engineering and Management Journal*, **8** (2), 289-295.

Full Text: 2009\Env Eng Man J8, 289.pdf

Abstract: The lead(II) ions sorption from aqueous solutions on three types of peat from Poiana Stampei (Romania) was studied. The peat was drawing from different deeps, such as 5-10 cm deep (peat I), 0.5-1.0 m deep (peat 2) and from > 1.5 in deep (peat 3). The influence of several experimental parameters (initial lead concentration, contact time) was studied in batch experiments. The kinetics of sorption was followed based on the amount of lead(II) ions retained at various time intervals. The results show that sorption (chemical bonding) might be rate-limiting elementary process in the sorption of lead(II) ions on peat. The experimental data were analyzed using two kinetics models: pseudo-first order Lagergren model and pseudo-second order Ho model. On the basis of these models, the kinetics parameters (the rate constant, the equilibrium sorption capacity and the initial sorption rate) for lead(II) ions sorption onto all three types of peat were calculated and discussed.

Keywords: Adsorption, Aqueous Solutions, Batch, Batch Experiments, Biosorption, Cadmium, Capacity, Chemical, Concentration, Copper, Data, Equilibrium, Experimental, Experiments, Heavy-Metals, Intervals, Ions, Kinetics, Kinetics Models, Lagergren Model, Lead, Lead(II), Model, Models, Peat, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Constant, Removal, Romania, Solutions, Sorption, Sorption Capacity, Sphagnum Moss Peat, Waste-Water

? Apreutesei, R.E., Catrinescu, C. and Teodosiu, C. (2009), Studies regarding phenol and 4-chlorophenol sorption by surfactant modified zeolites. *Environmental Engineering and Management Journal*, **8** (4), 651-656.

Full Text: 2009\Env Eng Man J8, 651.pdf

Abstract: Phenols and chlorophenols are contaminants in soils, sediments, surface waters and groundwater, largely because of their worldwide utilization in the last 50 years as wood preservatives and general biocides in industry and agriculture. The toxicity of chlorophenols and their persistence in the environment require advanced treatment techniques for their removal. This study presents the results of a comparative evaluation of the adsorption of phenol and 4-chlorophenol from aqueous solutions, on surfactant modified zeolites (SMZ). Surfactant modified zeolites (SMZ) are produced by treating zeolites with large cationic surfactants (quaternary amines). These bulky organic cations exchange selectively with the native inorganic cations from the zeolite. to form a stable, organic-rich coating on the external surface of the zeolite. Surfactant modification alters considerably the chemistry of the zeolites surface, allowing the zeolites to sorb nonpolar organic pollutants and anions, for which untreated zeolites have little affinity. In this study, a natural zeolite from Romania, containing mainly clinoptilolite has been treated with a 0.02 M solution of hexadecyltrimethylammonium chloride (HDTMA). The unmodified zeolitic material possesses an insignificant adsorption capacity for phenol and 4-chlorophenol. In the SMZ, HDTMA molecules form a hydrophobic layer on the zeolite external surface, increasing the adsorption capacity of the natural zeolite for organic pollutants. Batch studies were performed to evaluate the influence of various experimental parameters such as contact time, adsorbent dose and initial pollutant concentration on the removal of phenol and 4-chlorophenol. Two kinetic models have been used to investigate the adsorption of phenol and 4-chlorophenol on surfactant modified zeolites. Good correlation coefficients have been obtained for the pseudo-second order kinetic model. Freundlich and Langmuir isotherm models have been used for the analysis of the adsorption equilibrium; the equilibrium data were best represented by Freundlich isotherm. It was also found that the adsorption capacity of SMZ was higher for 4-chlorophenol then for phenol. Removal efficiencies varied from 41 to 80% for phenol and from 82 to 98% for 4-chlorophenol.

Keywords: 4-Chlorophenol, Adsorbent, Adsorbent Dose, Adsorption, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Agriculture, Analysis, Anions, Aqueous Solutions, Capacity, Chemistry, Chloride, Chlorophenols, Clinoptilolite, Coating, Concentration, Contaminants, Correlation, Data, Environment, Equilibrium, Evaluation, Experimental, Freundlich, Freundlich Isotherm, General, Groundwater, Hdtma, Hexadecyltrimethylammonium, Isotherm, Kinetic, Kinetic Model, Kinetic Models, Langmuir, Langmuir Isotherm, Model, Models, Modification, Modified, Natural, Natural Zeolite, Organic, Organic Pollutants, Oxidation, Persistence, Phenol, Phenols, Pollutants, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Romania, Sediments, SMZ, Soils, Solution, Solutions, Sorption, Surface, Surfactant, Surfactants, Systems, Techniques, Toxicity, Treatment, Utilization, Water, Waters, Wood, Zeolite, Zeolites

? Visa, M. and Duta, A. (2009), Enhanced heavy metal adsorption on dye-modified fly ash. *Environmental Engineering and Management Journal*, **8** (4), 803-808.

Full Text: 2009\Env Eng Man J8, 803.pdf

Abstract: The use of fly ash (FA) in wastewater treatment received a lot of attention for the immobilization of heavy metal cations, mainly Cd2+, Pb2+, Ni2+, Zn2+, Cu2+. For an up-scalable wastewater treatment process, the substrate must have good adsorption efficiency and relatively constant behaviour. Modifying the fly ash surface can be a solution for reaching both goals. The use of FA for heavy metals removal, from wastewaters resulted in the dye finishing industry, faces a supplementary problem, related to the dyes affinity for oxide surfaces. Working with industrial wastewaters proved that there is a competitive adsorption process involving heavy metal cations and dyes. The paper presents the results obtained when modifying FA powders, with NaOH 1N and 2N solutions; the XRD experiments confirmed that dissolution/reprecipitation processes are responsible for the increase in the heavy metal immobilization. The AFM proved that the initial surface morphology plays an important role in these processes. The modified FA is loaded with methylene blue and the novel substrates are tested for cadmium, copper and nickel removal. The adsorption kinetic, the substrate capacities and the mechanisms are further discussed correlated with the surface structure and morphology. The results show that, FA with controlled surface properties allows the heavy metals removal resulting waters respecting the discharge regulations. Supplementary, the heavy metal maximal load allows the FA discharge without any further treatment.

Keywords: Adsorption, Adsorption Kinetic, AFM, Behaviour, Cadmium, Cd2+, Competitive, Competitive Adsorption, Copper, Cu2+, Discharge, Dye, Dyes, Efficiency, Experiments, Fly Ash, Heavy Metal, Heavy Metals, Immobilization, Kinetic, Load, Mechanisms, Metal, Metals, Metals Removal, Methylene Blue, Modified, Morphology, NaOH, Ni2+, Nickel, Nickel Removal, Oxide, Pb2+, Regulations, Removal, Role, Solution, Solutions, Structure, Surface, Surface Modification, Surface Properties, Surface Structure, Surfaces, Treatment, Waste-Water, Wastewater, Wastewater Treatment, Wastewaters, Waters, XRD, Zn2+

? Cocheci, L., Pode, R., Popovici, E., Dvininov, E. and Iovi, A. (2009), Sorption removal of chromate in single batch systems by uncalcined and calcined Mg/Zn-Al-type hydrotalcites. *Environmental Engineering and Management Journal*, **8** (4), 865-870.

Full Text: 2009\Env Eng Man J8, 865.pdf

Abstract: This work investigated the sorption removal of chromate anion, in single batch systems, from aqueous solutions. The process involves the sorption of the chromate by a series of Mg/Zn-Al - type hydrotalcites, with four Mg/Zn/Al ratios, in two forms: uncalcined and calcined at 500°C. The calcined Mg-Al (Mg/Zn/Al = 2/0/1) material showed the highest sorption capacity: 35.7 mg/g. The three-parametered Langmuir-Freundlich model approximated the experimental equilibrium data over the concentration range to the best. The kinetic results of the anion sorption were fitted satisfactory with the Lagergren equation for the uncalcined and with the pseudo-second order model for the calcined materials, respectively. The calcined Mg/Zn-Al - type hydrotalcites were able to remove more than 50% of chromate anionic species within a wide range of concentration.

Keywords: Adsorption, Anions, Aqueous Solutions, Batch, Calcined, Capacity, Catalysts, Chromate, Concentration, Cr(VI), Data, Equilibrium, Experimental, Fluoride, Forms, Hydrotalcites, Kinetic, Kinetics, Lagergren Equation, Langmuir-Freundlich, Layered Double Hydroxides, Model, Oxidation, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Removal, Solutions, Sorption, Sorption Capacity, Species, Systems, Water, Water Remediation, Work

? Caliman, F.A., Apostol, L.C., Bulgariu, D., Bulgariu, L. and Gavrilescu, M. (2009), Influence of soil particle size onto sorption of Tartrazine from aqueous solutions. *Environmental Engineering and Management Journal*, **8** (5), 1081-1087.

Full Text: 2009\Env Eng Man J8, 1081.pdf

Abstract: Tartrazine, (CI 19140) is an azo dye widely used in pharmaceuticals, cosmetics and foodstuff, as well as for coloring the textiles, hence it can be easily found in municipal wastewaters or wastewaters originating from textile, food, drugs and cosmetic industry. In this work, the capacity of a Romanian soil to retain Tartrazine from aqueous solution by sorption onto soil particles of different size has been investigated. The sorption kinetics was studied by applying five kinetic models aiming at establishing the model that best describes the sorption of the azo dyes onto the particles of soils of different size.

Keywords: Aqueous, Azo Dye, Capacity, Cosmetics, Dye, Dyes, Kinetic, Kinetic Models, Kinetics, Model, Models, Particles, Pharmaceuticals, Removal, Soil, Soils, Sorption, Sorption Kinetics, Tartrazine, Wastewaters

? Caramalau, C., Bulgariu, L. and Macoveanu, M. (2009), Adsorption characteristics of Co(II) ions from aqueous solutions on romanian peat moss. *Environmental Engineering and Management Journal*, **8** (5), 1089-1095.

Full Text: 2009\Env Eng Man J8, 1089.pdf

Abstract: Peat moss has been widely used as low-cost adsorbent to remove a variety of pollutants, including organic compounds and metal ions from aqueous effluents. Various functional groups allow such compounds to bind on active sites of peat moss. The adsorbent used in this study was Romanian peat moss sampled from Poiana Stampei (Romania). The adsorption of Co(II) ions from aqueous solutions on Romanian peat moss was studied in batch experiments, in order to establish the influence of initial solution pH, peat moss dose, initial Co(II) concentration and contact time on the adsorption efficiency. The adsorption data fitted well the Langmuir isotherm model. The maximum adsorption capacity (q(mqx)) was 30.67 mg/g. The effect of temperature on Co(II) adsorption process was also investigated in the temperature range between 9 and 64°C, and various thermodynamic parameters, such as ΔG, ΔH and ΔS, have been calculated.

Keywords: Adsorption, Adsorption Capacity, Aqueous, Biosorption, Capacity, Co(II) Ions, Groups, Heavy-Metals, Isotherm, Isotherms, Langmuir, Langmuir Isotherm, Metal, Metal Ions, Model, Moss, Organic Compounds, Peat, pH, Removal, Romanian Peat Moss, Solutions, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Waste-Water

? Bulai, P., Balan, C., Scripcariu, C. and Macoveanu, M. (2009), Equilibrium and kinetic studies of copper(II) removal on purolite s930 resin. *Environmental Engineering and Management Journal*, **8** (5), 1103-1109.

Full Text: 2009\Env Eng Man J8, 1103.pdf

Abstract: The presence of heavy metals in the environment is a major concern due to their non-biodegradability, bioaccumulation tendency, persistence in nature and toxicity to many life forms. Different treatment techniques for wastewater laden with copper have been developed in recent years to decrease the amount of wastewater produced and to improve the quality of the treated effluent. All techniques have their advantages and limitations in application. One of the most used techniques to remove copper from waste water is based on ion exchange process. In this study, the Purolite S930 resin with iminodiacetic acid (IDA) functional groups was used to remove Cu(II) ions from synthetic aqueous solutions. Batch sorption experiments were performed using both forms of the resin (sodium S930-Na and hydrogen S930-H) by varying the initial solution pH (1.0-5.0), initial concentration of copper (10 300 mg/L), temperature (20-40ºC) and contact time (10 minutes up to 24 hours). The practical capacity of the resin increases with the initial solution pH, temperature and concentration of copper ions. It was observed that, initially sorption increases rapidly, but after that, the rate becomes slower; the equilibrium can be considered attained after 24 hours. The equilibrium data were analysed using Freundlich, Langmuir and Dubinin-Radushkevich sorption isotherm models; sorption was best fitted by the Langmuir model. The values of calculated thermodynamic parameters (Δ*G*, Δ*H* and Δ*S*) indicate that the sorption is an endothermic and spontaneous process. The sorption kinetic data were tested using the pseudo-first order, pseudo-second order and intraparticle diffusion kinetic models; kinetic studies showed that the sorption of copper onto chelating resin followed a pseudosecond order reaction.

Keywords: Adsorption, Application, Aqueous Solutions, Aqueous-Solution, Bioaccumulation, Capacity, Chelating Resin, Chelating Resins, Concentration, Copper, Copper (II) Removal, Cu(II), Cu(II) Ions, Data, Diffusion, Endothermic, Environment, Equilibrium, Experiments, Forms, Freundlich, Functional Groups, Heavy Metals, Hydrogen, Intraparticle Diffusion, Ion Exchange, Ion-Exchange, Ions, Isotherm, Kinetic, Kinetic Models, Kinetic Studies, Kinetics, Langmuir, Langmuir Model, Life, Metal-Ions, Metals, Model, Models, Peat, Persistence, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Purolite S 930, Quality, Quality of, Removal, Resin, Sodium, Solution, Solutions, Sorption, Sorption Isotherm, Techniques, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Toxicity, Treatment, Waste, Waste Water, Wastewater, Water

? Caramalau, C., Bulgariu, L. and Macoveanu, M. (2009), Adsorption Characteristics of Co(II) ions from aqueous solutions on romanian peat moss. *Environmental Engineering and Management Journal*, **8** (5), 1089-1095.

Full Text: 2009\Env Eng Man J8, 1089.pdf

Abstract: Peat moss has been widely used as low-cost adsorbent to remove a variety of pollutants, including organic compounds and metal ions from aqueous effluents. Various functional groups allow such compounds to bind on active sites of peat moss. The adsorbent used in this study was Romanian peat moss sampled from Poiana Stampei (Romania). The adsorption of Co(II) ions from aqueous solutions on Romanian peat moss was studied in batch experiments, in order to establish the influence of initial solution pH, peat moss dose, initial Co(II) concentration and contact time on the adsorption efficiency. The adsorption data fitted well the Langmuir isotherm model. The maximum adsorption capacity (*q*max) was 30.67 mg/g. The effect of temperature on Co(II) adsorption process was also investigated in the temperature range between 9 and 64ºC, and various thermodynamic parameters, such as ΔG, ΔH and ΔS, have been calculated.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Aqueous Solutions, Batch, Batch Experiments, Biosorption, Capacity, Co(II), Co(II) Ions, Concentration, Data, Efficiency, Effluents, Experiments, Functional Groups, Heavy-Metals, Ions, Isotherm, Isotherm Model, Isotherms, Langmuir, Langmuir Isotherm, Langmuir Isotherm Model, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Metal, Metal Ions, Model, Moss, Organic, Organic Compounds, Peat, Peat Moss, pH, Pollutants, Removal, Romania, Romanian Peat Moss, Solution, Solutions, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Waste-Water

? Pavel, V.L., Bulgariu, D., Bulgariu, L., Hlihor, R.M. and Gavrilescu, M. (2009), Studies on sorption and transport processes of cadmium in soils. *Environmental Engineering and Management Journal*, **8** (6), 1315-1320.

Full Text: 2009\Env Eng Man J8, 1315.pdf

Abstract: Heavy metals produced and released by anthropogenic activities generate serious environmental problems. Ions of toxic metals can bind to the mineral surface in a number of ways, including absorption, adsorption, precipitation, ion exchange. The paper shows that the fate and migration of heavy metals in soils strongly depend on the physical properties and chemical and mineralogical composition of such environments. Cadmium is one of the most toxic metals with carcinogenic and teratogenic impacts. Leaching of cadmium through soil profiles has implications for both its accumulation in subsoil or contamination of groundwater. The main objective of the research entails the study of the transport of cadmium in soil matrix. Samples with specific amounts of carbonates, organic matter, chemical composition and various grain sizes were chosen. Solutions with different concentrations of CdSO4 were prepared for the simulation of a contamination by Cd(II). The sorption of cadmium on all the soil particles and the equilibrium and kinetic parameters characterizing the process of adsorption in the soil matrix were estimated by the conventional batch techniques. Experimental sorption data from batch tests were evaluated by certain isotherms, which provided main sorption characteristics of soil samples for Cd. The results showed that concentrations of total dissolved cadmium and activity of its free ions in soil solution are influenced, sorbent characteristics, that is particle dimensions in this case.

Keywords: Absorption, Accumulation, Adsorption, Anthropogenic, Aqueous-Solutions, Batch, Batch Tests, Cadmium, Cd, Cd(II), Characteristics, Chemical, Composition, Contamination, Conventional, Data, Dissolved, Environmental, Environmental Problems, Equilibrium, Fate, Groundwater, Heavy Metals, Heavy-Metals, Impacts, Ion Exchange, Ion-Exchange, Ions, Isotherms, Kinetic, Kinetic Parameters, Matrix, Metals, Migration, Organic, Organic Matter, Particles, Peat, Physical, Precipitation, Profiles, Remediation, Removal, Research, Simulation, Soil, Soil Particles, Soil Solution, Soils, Solution, Sorbent, Sorption, Subsoil, Surface, Techniques, Toxic, Toxic Metals, Transport

? Caliman, F.A., Apostol, L.C., Bulgariu, D., Bulgariu, L. and Gavrilescu, M. (2009), Study regarding the sorption of erythrosine from aqueous solution onto soil. *Environmental Engineering and Management Journal*, **8** (6), 1339-1346.

Full Text: 2009\Env Eng Man J8, 1339.pdf

Abstract: In this paper, the capacity of a soil to retain the dye Erythrosine B from aqueous solution by sorption has been studied. Batch adsorption experiments were conducted to investigate the sorption of the dye from aqueous solutions onto soil with particles of different size. Different models were used to describe the kinetic data, to calculate the corresponding rate constants and to predict the theoretical capacities of soil for dye sorption.

Keywords: Adsorption, Aqueous Solution, Aqueous Solutions, Batch Adsorption, Capacity, Data, Dye, Dye, Erythrosine, Experiments, Kinetic, Models, Particles, Rate Constants, Size, Soil, Solution, Solutions, Sorption

? Caramalau, C., Bulgariu, L. and Macoveanu, M. (2009), Kinetic study of cobalt(II) adsorption on peat activated by simple chemical treatments. *Environmental Engineering and Management Journal*, **8** (6), 1351-1358.

Full Text: 2009\Env Eng Man J8, 1351.pdf

Abstract: In this study the adsorption of cobalt(II) from aqueous solutions on peat (from Poiana Stampei, Romania) activated by simple chemical treatments, was investigated from kinetic point of view. The chemical treatments suppose the mixing of peat with aqueous solutions of common chemical reagents (H2SO4, NaCl and NaOH), without the addition of supplementary additives. An increase of adsorption capacity of peat was obtained in case of treatments with NaCl and NaOH respectively, and this is mainly attributed to the increase of functional groups availability from adsorbent surface. In order to estimate the performances of activated peat in adsorption process of cobalt(II) from aqueous solutions, the influence of initial metal ion concentration and contact time was studied in batch system, in comparison with untreated peat. The experimental data were analyzed using three kinetics models: pseudo-first order, pseudo-second order and intra-particle diffusion models. On the basis of these models the kinetics parameters (rate constants and equilibrium adsorption capacities) were calculated.

Keywords: Adsorbent, Adsorption, Adsorption Capacities, Adsorption Capacity, Aqueous Solutions, Aqueous-Solutions, Availability, Batch, Batch System, Biomass, Biosorption, Capacity, Chemical, Chemical Treatment, Chemical Treatments, Co(II), Cobalt(II), Comparison, Concentration, Data, Diffusion, Divalent Metal-Ions, Equilibrium, Experimental, Functional Groups, Heavy-Metals, Intra-Particle Diffusion, Intraparticle Diffusion, Kinetic, Kinetics, Kinetics Models, Metal, Metal Ion, Mixing, Models, NaCl, NaOH, Peat, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Constants, Removal, Romania, Solutions, Sorption, Sphagnum Moss Peat, Surface, Time, Treatments

? Smaranda, C., Bulgariu, D. and Gavrilescu, M. (2009), An investigation of the sorption of acid orange 7 from aqueous solution onto soil. *Environmental Engineering and Management Journal*, **8** (6), 1391-1402.

Full Text: 2009\Env Eng Man J8, 1391.pdf

Abstract: The goal of the study was to investigate the sorption behavior of Acid Orange 7 (C.I. 15510) onto soil collected from Iasi area (Romania). The sorption isotherm, kinetic and thermodynamic studies were performed by batch mode. The effects of experimental parameters such as contact time, pH value (2-12) and temperature (20 - 40ºC) have been studied. Also the influence of initial dye concentration (10 - 100 mg/L) and sorbent dosage (from 5 g L-1 to 150 g L-1) were studied. It was found that equilibrium sorption amount increases with the increase in initial dye concentration, contact time, temperature and solution acidity. The experimental data were analyzed using four isotherm models, Langmuir, Freundlich, Temkin and Dubinin-Radushkevich. Sorption of Acid Orange 7 onto soil followed the Freundlich model. The pseudo first-order, pseudo second-order and intraparticle diffusion equations were selected to analyzed the sorption kinetic. Kinetic parameters, such as rate constants, equilibrium sorption capacities and correlation coefficients were calculated and discussed for each kinetic equation. It was shown that that sorption of Acid Orange 7 onto soil is well described by the pseudo second-order model. The thermodynamic study indicates that the sorption of Acid Orange 7 onto soil is spontaneous and endothermic.

Keywords: Acid Orange 7, Acidity, Activated Carbon, Adsorption Characteristics, Anionic Dye, Batch, Batch Mode, Behavior, Concentration, Congo-Red, Correlation, Cross-Linked Chitosan, Data, Diffusion, Dye, Endothermic, Equilibrium, Experimental, First Order, Fly-Ash, Freundlich, Freundlich Model, Intraparticle Diffusion, Isotherm, Kinetic, Kinetic Equation, Kinetic Models, Kinetic Parameters, L1, Langmuir, Methylene-Blue, Mode, Model, Models, pH, pH Value, Process Design, Pseudo First Order, Pseudo First-Order, Pseudo Second Order, Pseudo Second-Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Constants, Romania, Second Order, Second-Order, Second-Order Model, Soil, Solution, Sorbent, Sorption, Sorption Isotherm, Temperature, Thermodynamic, Thermodynamic Studies, Thermodynamics, Time, Value, Waste-Water

? Bulai, P., Balan, C., Cojocaru, C. and Macoveanu, M. (2009), Optimization of process variables to maximize the copper loading capacity of purolite S930 resin. *Environmental Engineering and Management Journal*, **8** (6), 1413-1419.

Full Text: 2009\Env Eng Man J8, 1413.pdf

Abstract: The practical capacity of an ion exchange or chelating resin depends on various process variables, such as initial solution pH, initial metal ion concentration, metal/resin ratio, contact time and temperature. This work presents the optimization of process variables to maximize the copper loading capacity of chelating resin Purolite S930. To study the combined effect of the initial solution pH, initial Cu(II) concentration and resin dosage were used a 2(3) orthogonal central composite design for experiments design and Response Surface Methodology (RSM) for analysis of experimental results. The Gradient method was used to optimize the regression equation. The optimum values of these variables were found to be pH = 4.77, C = 246.60 mg Cu/L and a = 0.394 g resin/L, respectively; in this point loading capacity is the maximum one (146.641 mg Cu(II)/g given by empirical model and 144.22 confirmed experimentally).

Keywords: Adsorption, Analysis, Aqueous-Solution, Biosorption, Capacity, Chelating Resin, Composite, Concentration, Copper, Copper (II) Removal, Cu, Cu(II), Design, Experimental, Experiments, Gradient Method, Heavy-Metals, Ion Exchange, Ion-Exchange, Lead(II), Loading, Metal, Metal Ion, Model, Optimization, pH, Preconcentration, Purolite S 930, Regression, Removal, Resin, RSM, Solution, Sorption, Temperature, Time, Work

? Pavel, V.L., Bulgariu, D., Bulgariu, L., Hlihor, R.M. and Gavrilescu, M. (2010), Analysis of factors determining the behaviour of chromium in some Romanian soils. *Environmental Engineering and Management Journal*, **9** (1), 89-94.

Full Text: 2010\Env Eng Man J9, 89.pdf

Abstract: Chromium (Cr) is one of the most common metal contaminants in soil because of its use in ore refining, production of steel and alloys, metal plating, tanneries, wood preservation, and pigmentation. In soil environment, the most stable oxidation states of chromium are Cr(III) and Cr(VI). While Cr(III) is considered an essential trace element for the functioning of living organisms, Cr(VI) is toxic and carcinogenic to humans via inhalation for long exposures, since it is easily soluble and mobile in soils and can be leached into surface water or groundwater, and taken up by plants. The efficacy of remediation processes are highly dependent on chromium sorption and desorption kinetics and on the influence of competing solute anions. Models to predict the transport of Cr(VI) in soils must therefore incorporate these effects. The objective of the study was to speciate and to evaluate various soil Cr species in relation to soil properties. Adsorption and reduction of added Cr(VI) were characterized in soils with contrasting pH, organic matter contents, and chemical and mineralogical properties. Batch experiments are used to determine equilibrium sorption parameters for chromium by soil and to study sorption kinetics that are relevant to soil contamination sites. The distribution of metal contaminant in soils can be strongly localized by transport limitations and redox gradients within soil aggregates. The soils adsorption and reduction capacities were eventually overwhelmed, however, and permitted the passage of Cr(VI) into the underlying ground water.

Keywords: Adsorption, Biosorption, Cadmium, Chromium, Contaminants, Contamination, Cr(VI), Desorption, Desorption Kinetics, Environment, Equilibrium, Groundwater, Heavy Metals, Isotherm, Kinetics, Metal, Models, pH, Reduction, Remediation, Removal, Single, Soil, Soils, Solute, Sorption, Sorption, Sorption Kinetics, Species, Surface Water, Transport, Water, Wood

? Pohontu, C., Cretescu, I., Secula, M.S., Paduraru, C., Tofan, L. and Macoveanu, M. (2010), Integrated treatment of leachate from municipal waste solid landfill. *Environmental Engineering and Management Journal*, **9** (1), 95-100.

Full Text: 2010\Env Eng Man J9, 95.pdf

Abstract: The present paper proposes an integrated-treatment process of leachate from a municipal landfill, which involves two treatment steps. The first step consists in diminishing the organic content through an advanced oxidation process using ozone and hydrogen peroxide. The second step is performed in order to diminish the content of heavy metals through a sorption process on a natural low-cost biosorbent, thus the traces of organic substances remained after oxidative degradation or oxidation-intermediate products are removed. From the point of view of the oxidative process of organic substances in the leachate can be mentioned the simultaneous action of two strong oxidants such as ozone. A mineralization rate related to COD-Cr of around 20 % is obtained after approximately four hours of pretreatment using an ozone generator with a productivity of 0.5 g Ozone corresponding to an energy consumption less then 1kWh. At the same time, a maximum 65 % decolorization is achieved. Using moss peat from Poiana Stampei (Romania) as biosorbent, removal rates of 95% is achieved in case of leachate solution containing 2.19 mg/L of copper ions. In relation to the organic content, the sorption treatment rates ranges between 12 and 18%, which correspond to a total organic content of 770 mg O-2/L.

Keywords: Adsorption, Advanced Oxidation Processes, Aqueous-Solution, Biosorbent, Consumption, Content, Copper, Decolorization, Degradation, Energy, Energy Consumption, First, Fly-Ash, Heavy Metals, Heavy-Metals, Hydrogen, Hydrogen Peroxide, Ions, Landfill, Leachate, Low Cost, Metals, Mineralization, Natural, Organic, Oxidation, Oxide-Coated Sand, Ozone, Ozonization, Peat, Pretreatment, Productivity, Rates, Red Muds, Removal, Retention, Romania, Solution, Sorbents, Sorption, Sorption, Sorption Process, Time, Treatment, Wastewater Treatment

? Cretescu, I., Diaconu, M., Cojocaru, C., Benchea, R.E. and Pohontu, C. (2010), Removal of Dunkel Blau dye from aqueous solutions by fungal and peat biomass in batch mode. *Environmental Engineering and Management Journal*, **9** (1), 107-112.

Full Text: 2010\Env Eng Man J9, 107.pdf

Abstract: Wastewaters of textile and leather dying industries contain significant quantities of water-soluble dyes. Moreover the temperature and pH of these wastewaters may be controlling variables affecting the biosorption performance. In this study the sorption of dark blue dye by *Aspergillus* biomass and peat was studied as a function of temperature, initial dye concentration, and initial pH values. In addition, the effects of sorbent dosage on the sorption processes were systematically studied in batch shaking sorption experiment. The results revealed that the high biosorption performance has been achieved for *Aspergillus* biomass for the conditions of T=35ºC and pH 5-6. The best efficiency of peat for dye sorption occurred at T=45ºC and pH 4-5. Maximum removal efficiency of 69% was reached for Aspergillus biosorbent at 35ºC, while for peat sorbent a maximum removal efficiency of 73% at 45ºC was obtained. Experimental data were modeled by Sips equilibrium equation. A goodness-of-fit between experimental and predicted data was observed.

Keywords: Adsorption, Batch, Batch Shaking, Biomass, Biosorbent, Biosorption, Concentration, Copper, Data, Dye, Dyes, Dying, Efficiency, Equilibrium, Experiment, Experimental, Function, Ions, Isotherms, Peat, Performance, pH, Removal, Removal Efficiency, Sorbent, Sorption, Sorption, Temperature, Wastewaters

? Cretescu, I., Diaconu, M., Dughila, A., Stefanache, A. and Pohontu, C. (2010), Studies on the biosorption of terasil dye by *Aspergillus niger* dead biomass. *Environmental Engineering and Management Journal*, **9** (3), 335-339.

Full Text: 2010\Env Eng Man J9, 335.pdf

Abstract: Textile dyeing process is an important source of contamination responsable for the continous pollution of the environment Control of water pollution has importance for both organisms, which live in water and those who benefit from water. Many dyes reaching the water source are difficult to decompose and cause many problems due to their carcinogenicity Consequently, it is Important to remove these pollutants from wastewater before their final disposal. This paper reports the resuls of the biosorption of Terasil dye on dead *Aspergillus niger* biomass. The adsorption behavior of the dye as a function of temperature, pH and initial dye concentration were also studied. Adsorption data were fitted to Freundlich, Langmuir and Sips isotherms and their corresponding adsorption parameters such as K-F, n and K-L respectively was calculated.

Keywords: Adsorption, Adsorption Behavior, Adsorption Isotherm, Aqueous-Solutions, *Aspergillus niger*, Behavior, Biomass, Biosorption, Concentration, Contamination, Data, Decolorization, Disposal, Dye, Dyeing, Dyes, Environment, Equilibrium, Freundlich, Function, Fungus Biomass, Ions, Isotherms, Langmuir, Mar, Peat, pH, Pollutants, Pollution, Removal, SI, Sorption, Source, Temperature, Wastewater, Water, Water Pollution

? Kicsi, A., Bilba, D. and Macoveanu, M. (2010), Equilibrium and kinetic modeling of Zn(II) sorption from aqueous solutions by sphagnum moss peat. *Environmental Engineering and Management Journal*, **9** (3), 341-349.

Full Text: 2010\Env Eng Man J9, 341.pdf

Abstract: Equilibrium and kinetics of sorption of Zn(II) ions from aqueous solutions of pH 5 on indigene (Romanian) peat moss were investigated in batch system. The experimental equilibrium sorption data at three temperatures were analysed by Freundlich, Langmuir, Tempkin and Dubinin-Radushkevich sorption Isotherm models. Results indicate the following order in to fit the isotherm equations: Langmuir > Tempkm > Dubinin-Radushkevich > Freundlich. The equilibrium sorption capacity determined from Langmuir equation was found to be 12.56 mg/g at 30ºC. The computed thermodynamic parameters indicate the spontaneous and endothermic nature of the sorption process. The FTIR spectra confirm the ion exchange mechanism of the sorption. Different kinetic models were tested in order to identify a suitable kinetic equation; the experimental kinetic data were best correlated by pseudo-second order equation.

Keywords: Adsorption, Agricultural Waste, Aqueous Solutions, Batch, Batch System, Biosorption, Cadmium, Capacity, Data, Divalent Metal-Ions, Endothermic, Equilibrium, Equilibrium Study, Experimental, Fly-Ash, Freundlich, FTIR, FTIR Spectra, Heavy-Metals, Ion Exchange, Ion-Exchange, Ions, Isotherm, Isotherm Equations, Isotherm Models, Kinetic, Kinetic Data, Kinetic Equation, Kinetic Models, Kinetics, Langmuir, Langmuir Equation, Mar, Mechanism, Modeling, Models, Moss, Peat, Peat Moss, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Removal, Si, Solutions, Sorption, Sorption Capacity, Sorption Process, Thermodynamic, Thermodynamic Parameters, Wheat Bran, Zinc, Zinc

? Argun, M.E., Karatas, M. and Dursun, S. (2010), Treatment of mineral-oil recovery industry wastewater by sequential aeration and Fenton’s oxidation process. *Environmental Engineering and Management Journal*, **9** (5), 643-649.

Full Text: 2010\Env Eng Man J9, 643.pdf

Abstract: This study describes the treatment of preliminary aerated mineral-oil recovery industry wastewater (MORIW) using Fenton’s reagent. Application parameters such as Fe2+ and H2O2 concentration, pH value, reaction period, temperature, and sludge characteristics were examined. Maximum oxidation efficiency (about 90% COD removal and 80% UV254 removal) was achieved at the conditions of 0.003 Fe2+:H2O2 ratio, 180 min reaction period, pH 3 and 293 K temperature. The oxidation process of MORIW followed pseudo-second-order reaction kinetic. The studied sludge character has a high density with settling velocity. In addition, the high settlement rate (SR) and liquid/solid ratio (L/S) values demonstrated that the formed sludge was suitable for dewatering and drying processes.

Keywords: Aqueous-Solution, Azo-Dye, Characteristics, Cod, Cod Removal, Concentration, Decolorization, Degradation, Dewatering, Efficiency, Fenton Process, Fenton’s Reagent, H2O2, Hydrogen-Peroxide, Kinetic, Kinetics, Mineral Oil Recovery Industry, Orange, Oxidation, pH, Ph Value, Pretreatment, Pseudo Second Order, Pseudo-Second-Order, Recovery, Removal, Settling Velocity, Sludge, Sphagnum Moss Peat, System, Temperature, Treatment, Value, Wastewater

? Bulgariu, L., Bulgariu, D. and Macoveanu, M. (2010), Kinetics and equilibrium study of nickel(II) removal using peat moss. *Environmental Engineering and Management Journal*, **9** (5), 667-674.

Full Text: 2010\Env Eng Man J9, 667.pdf

Abstract: In this study, the removal of nickel(II) ions from aqueous solutions using peat moss sampled from *Poiana Stampei* (Romania) under different experimental conditions (different initial concentrations of metal ion and contact time) was investigated, in batch experiments. The kinetics of adsorption process was followed based on the amount of nickel(II) ions retained at various time intervals, and the experimental results were analyzed using three kinetic models: pseudo-first order, pseudo-second order and infra-particle diffusion models. The rate constants of adsorption process for all these kinetic models were calculated. Good correlation coefficients were obtained for the pseudo-second order kinetic model, showing that nickel(II) uptake process followed the pseudo-second order rate expression. Adsorption isotherms were expressed by Langmuir and Freundlich adsorption models. The Langmuir model fit the experimental data with high correlation coefficient and better than Freundlich model and the maximum adsorption capacity was obtained as 32.89 mg/g, at 65ºC. The effect of temperature on nickel(II) adsorption process was also investigated and various thermodynamic parameters (ΔG, ΔH and ΔS) have been calculated.

Keywords: Activated Carbon, Adsorption, Adsorption, Adsorption Capacity, Adsorption Isotherms, Aqueous Solutions, Aqueous-Solutions, Batch, Batch Experiments, Capacity, Copper, Correlation, Correlation Coefficient, Data, Diffusion, Divalent Metal-Ions, Equilibrium, Equilibrium Isotherm, Experimental, Experiments, Expression, Freundlich, Freundlich Model, Heavy-Metals, Intervals, Ions, Isotherms, Kinetic, Kinetic Model, Kinetic Models, Kinetics, Kinetics of Adsorption, Langmuir, Langmuir Model, Low-Cost Adsorbents, Metal, Model, Models, Moss, Nickel(II), Nickel(II) Ions, Peat, Peat Moss, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Constants, Removal, Romania, Soils, Solutions, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Uptake, Waste-Water

? Tchieda, V.K., Tonle, I.K., Tertis, M.C., Ngameni, E. and Jitaru, M. (2010), Adsorption of 2,4-dinitrophenol and 2,6-dinitrophenol onto organoclays and inorganic-organic pillared clays. *Environmental Engineering and Management Journal*, **9** (7), 953-960.

Full Text: [2010\Env Eng Man J9, 953.pdf](2010/Env%20Eng%20Man%20J9,%20953.pdf)

Abstract: The adsorption of two substituted nitrophenols, 2,4-dinitrophenol and 2,6-dinitrophenol on smectite clay modified by intercalation of hexadecylpyridinium bromide (O-Sa01) or hexadecylpyridinium bromide and complex hydroxy-aluminum (IO-Sa01) were studied. The adsorption experiments were conducted in batch mode. The results obtained show that adsorption increases with the initial concentration of the nitrophenols and equilibrium is reached within a short period of time (20 min). The maximum capacity uptake from waste water was 28.07 and 28.58 mg g-1 for O-Sa01 and IO-Sa01 respectively for an initial concentration of 18.40 mg L-1 of 2,4-dinitrophenol, and 24.65 and 26.62 mg g-1 of 2,6-dinitrophenol for O-Sa01 and IO-Sa01, respectively, for the same initial concentration as in the case of 2,4-dinitrophenol. Separation factor RL indicates that the adsorption of the nitrophenol compounds studied is more favorable on IO-Sa01. Adsorption was modeled by the equations of Langmuir, Freundlich, and Temkin. Kinetic data were described by the pseudo-first order and pseudo-second order equations. Based on the linear correlation coefficient (>0.97), the Langmuir model better represented the data.

Keywords: Activated Carbon, Adsorbents, Adsorption, Aqueous-Solutions, Batch, Batch Mode, Bentonite, Bromide, Capacity, Clay, Concentration, Correlation, Correlation Coefficient, Data, Equilibrium, Experiments, Freundlich, Hydroxyaluminum, Isotherm, Kinetic, Kinetics, L1, Langmuir, Langmuir Model, Mode, Model, Modified, Modified Clays, Nitroaromatic Compounds, Nitrophenols, Phenolic-Compounds, Pillared, 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, Separation, Separation Factor, Smectite, Smectite-Clay, Sorption, Temkin, Uptake, Waste, Waste Water, Water

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Full Text: [2010\Env Eng Man J9, 1243.pdf](2010/Env%20Eng%20Man%20J9,%201243.pdf)

Abstract: The batch removal of ammonium ions from aqueous solutions under different experimental conditions using (Al)Si-MCM-41 mesoporous molecular sieve in comparison with LTA microporous zeolite was investigated in this study. The ammonium uptake was dependent on the initial ammonium concentration. The equilibrium sorption data were fitted using Freundlich and Langmuir isotherm models. The Langmuir model (monolayer sorption) gave the best fit (R-2 = 0.9965 for (Al)Si-MCM-41 and R-2 = 0.9995 for LTA). The saturation capacity (monolayer coverage) was found of 33.33 mg NH4+/g (Al)Si-MCM-41 and 55.55 mg NH4+/g LTA. Equilibrium sorption was reached at about 25 min on (Al)Si-MCM-41 and at about 60-90 min in the case of LTA molecular sieves. The kinetic data showed that the sorption rate could be better described by pseudo-second order model.

Keywords: Adsorption, Al-MCM-41, Aluminosilicates, Aluminum, Ammonium, Equilibrium, Exchange, Freundlich, Isotherm, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Liquid-Crystal Template, LTA, Mesoporous, Mesoporous Aluminosilicate MCM-41, Molecular-Sieve MCM-41, Removal, Sorption, Sorption Isotherms, Waste-Water, Zeolite

? Pilli, S.R., Goud, V.V. and Mohanty, K. (2010), Biosorption of Cr(VI) from aqueous solutions onto *Hydrilla verticillata* weed: Equilibrium, kinetics and thermodynamic studies. *Environmental Engineering and Management Journal*, **9** (12), 1715-1726.

Full Text: [2010\Env Eng Man J9, 1715.pdf](2010/Env%20Eng%20Man%20J9,%201715.pdf)

Abstract: This work reports the ability of nonliving Hydrilla verticillata, an aquatic macrophyte to remove Cr(VI) from it’s aqueous solutions. The biosorbent was characterized by finding the bulk density, BET surface area, porosity and. pore volume. SEM combined with EDX was used to study the surface morphology of the biosorbent. FTIR spectrum analysis of the native and Cr(VI) loaded biosorbent revealed that O-H, N-H and C-O groups were the leading Cr(VI) binding groups. The efficiency of Cr(VI) removal was studied as a function of contact time, initial Cr(VI) concentration, pH, biosorbent dose, temperature and agitation speed. It was found that the initial pH of the solution greatly affected the Cr(VI) sorption efficiency. Optimum biosorption conditions were found to be pH 1.0, 0.1 g L-1 biosorbent dosage, 200 rpm agitation speed and 200 mm equilibrium time. An increase in temperature, increased the removal of Cr(VI) which indicated that the biosorption process was endothermic in nature. The biosorption kinetics followed the pseudo-second-order model closely and intra-particle diffusion was found to be the rate-controlling mechanism. The fitness of biosorption equilibrium data for Langmuir and Freundlich isotherm models were tested and it was found that the biosorption system was more likely monolayer coverage of H. verticillata biomass by the chromium ions.

Keywords: Activated Carbon, Adsorption, Bagasse, Biomass, Biosorbent, Biosorption, Chromium, Chromium(VI) Biosorption, Cr(VI), Equilibrium, Fly-Ash, Freundlich, Freundlich Isotherm, FTIR, Heavy-Metals, Hydrilla Verticillata, Isotherm, Kinetics, Langmuir, pH, Removal, Sorption, System, Thermodynamic, Thermodynamics, Waste-Water, Weed

? Senthil Kumar, P., Gayathri, R., Dinesh Kirupha, S., Raj Kumar, P., Nandagopal, J. and Sivanesan, S. (2011), Adsorption of dye from aqueous solution using silver wood sawdust carbon. *Environmental Engineering and Management Journal*, **10** (3), 451-460.

Full Text: 2011\Env Eng Man J10, 451.pdf

Abstract: Batch adsorption experiments were carried out for the removal of Direct Blue 2B (DB2B) from aqueous solution using newly prepared silver wood sawdust carbon. The operating variables studied are the solution pH, adsorbent dose, initial dye concentration and contact time. The dye removal is pH dependent and reaches a maximum at 3 or below. The experimental data were analyzed by the Langmuir, Freundlich, Temkin and Dubinin-Radushkevich isotherm equations using nonlinear regression analysis. Equilibrium data fitted well with the Langmuir model. The kinetic study showed that pseudo-second-order rate equation better described the adsorption process. Kinetic parameters, rate constants, equilibrium sorption capacities and related correlation coefficients, for each kinetic model were calculated and discussed. The adsorption process was found to be controlled by both surface and pore diffusion, with surface diffusion at the earlier stages followed by pore diffusion at the later stages. Analysis of adsorption data using a Boyd kinetic plot confirms that external mass transfer is the rate determining step in the sorption process. The results indicate that the silver wood sawdust carbon could be employed as a low cost alternative to commercial activated carbon in the removal of dyes from wastewater.

Keywords: Activated Carbon, Adsorption, Anionic Dyes, Aqueous Solution, Batch, Batch Adsorption, Carbon, Color Removal, Congo-Red, Dye, Dye Removal, Dyes, Equilibrium, Fly-Ash, Freundlich, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Kinetics, Langmuir, Nonlinear, pH, Process Design, Removal, Sawdust, Silver Wood Sawdust Carbon, Sorption, Textile Effluents, Waste-Water, Wastewater

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Full Text: [2011\Env Eng Man J10, 1255.pdf](2011/Env%20Eng%20Man%20J10,%201255.pdf)

Abstract: Methyl orange and methylen blue are two dyes resulted from the textile industry. They are not raising just esthetical problems, but they are toxic and hence harmful to aquatic animals. The aim of this study is to test the capacity of three types of sawdust (oak, willow and white poplar) and mixed substrates, sawdust: fly ash (FA), to remove the methyl orange (MO) and methylen blue (MB) from wastewater. The influence of contact time, solution pH and initial concentration of dyes on the bleaching efficiency was investigated. Sorption kinetic data were fitted to the pseudo-second-order model. Adsorption isotherms were investigated to completely understand the adsorption processes. The adsorption isotherm data were best fitted by the Freundlich isotherms in most cases. The kinetic and thermodynamic results outline the important role played by the substrates porosity and the dyes type, particularly the dyes volume. The results indicate the all substrates, sawdust and sawdust: FA can be used as an efficient and low-cost alternative for removal of the dyes from wastewater.

Keywords: Adsorption, Adsorption Isotherms, Ash, Biosorption, Dye Removal, Dyes, Isotherm, Mechanism, Methyl Orange, pH, Removal, Sawdust, Sorption, Wastewater Treatment

? Ahmadi, M., Teymouri, P., Setodeh, A., Mortazavi, M.S. and Asgari, A. (2011), Adsorption of Pb(II) from aqueous solution onto Lewatit FO36 nano resin: equilibrium and kinetic studies. *Environmental Engineering and Management Journal*, **10** (10), 1579-1587.

Full Text: 2011\Env Eng Man J10, 1579.pdf

Abstract: This investigation focused on the adsorption of Pb (II) onto Lewatit FO 36 resin from aqueous solutions. The effects of initial metal concentration, contact time, pH of solution were factors that affected the adsorption of Pb (II). Adsorption kinetic was better explained by the pseudo second order type 1 kinetic model that was confirmed by the values (R2>0.986). The Langmuir, Freundlich, Temkin and BET adsorption models were used for the equilibrium studies and Freundlich isotherm better described the adsorption equilibrium. According to the Langmuir isotherm the maximum adsorption capacity of Pb (II) onto Lewatit FO 36 was 62.5 mmolg-1 at pH 7 and 0.04 gL-1 resin dosage and 15min contact time.

Keywords: Adsorbent, Adsorption, Adsorption Kinetic, Bet, Biomass, Biosorption, Equilibrium, Freundlich, Heavy-Metals, Ion-Exchange-Resin, Isotherm, Kinetic, Kinetics, Langmuir, Lead (II), Lead(II) Ions, Lewatit Fo 36, Pb(II), pH, Removal, Sphagnum Moss Peat, Temperature

? Ciopec, M., Davidescu, C., Negrea, A., Lupa, L., Negrea, P., Popa, A. and Muntean, C. (2011), Use of D2EHPA-Impregnated XAD7 resin for the removal of Cd(II) and Zn(II) from aqueous solutions. *Environmental Engineering and Management Journal*, **10** (10), 1597-1608.

Full Text: 2011\Env Eng Man J10, 1597.pdf

Abstract: The adsorption performance of a novel support for metal ions sorption and their removal from aqueous solutions was examined. The support is a new solvent-impregnated resin (SIR) which can be considered as an alternative adsorbent material capable of selective sorption. The adsorbent was prepared by impregnating di-(2-ethylhexyl)-phosphoric acid (D2EHPA) onto Amberlite XAD7 resin beads, by dry impregnation method. The interaction between XAD7 resin and D2EHPA was evaluated by FTIR spectroscopy. Batch sorption experiments were carried out for the removal of Zn(II) and Cd(II) from synthetic aqueous solutions using the impregnated resin. The influences of various experimental parameters like pH, initial concentration, contact time and the effect of temperature were evaluated. The optimum pH range was 4-8 for Cd(II) ions and 4-7 for Zn(II) ions. The equilibrium was reached after 30 min with an overall adsorption performance of similar to 85% for Cd2+ and similar to 96% for Zn2+. The equilibrium adsorption data were well described by the Langmuir model. The values of the dimensional separation factor, R(L), indicated favorable adsorption. The maximum adsorption capacities of the XAD7-D2EHPA were similar to 5.0 mg Zn(II)/g and similar to 4.5 mg Cd(II)/g, respectively. The kinetics of the adsorption process was well explained and approximated by the pseudo-second-order kinetic model, and intra-particle diffusion was the rate-controlling step after rapid saturation of surface and big pores of XAD7-D2EHPA beads. The variation in the extent of adsorption with temperature was used to evaluate the thermodynamic parameters for the adsorption process. The values of ΔH° and ΔG° obtained demonstrated that the adsorption process was exothermic and spontaneous.

Keywords: Adsorbent, Adsorption, Amberlite XAD7, Cd(II), D2ehpa, Di-(2-Ethylhexyl)-Phosphoric Acid, Divalent Metal Ions, Divalent Metals, FTIR, Heavy-Metals, Impregnated Resins, Ion-Exchange, Kinetic, Kinetics, Langmuir, Octyl Phosphine Oxide, Organophosphorus Extractants, pH, Phosphoric-Acid, Rare-Earth-Elements, Removal, Solid-Liquid Extraction, Solvent Impregnated Resin, Sorption, Synthetic Resin

? Ramesh, S.T., Gandhimathi, R., Badabhagni, N. and Nidheesh, P.V. (2011), Removal of Cd(II) from aqueous solution by adsorption onto coir pith, an agricultural solid waste: Batch experimental study. *Environmental Engineering and Management Journal*, **10** (11), 1667-1673.

Full Text: 2011\Env Eng Man J10, 1667.pdf

Abstract: Coconut coir pith, an agricultural solid waste was used for the sorption of Cd(II) from aqueous solution in batch mode. Parameters like contact time, adsorbent dosage and pH effect were studied. Langmuir and Freundlich isotherms were used to model the adsorption equilibrium data and the system followed both the isotherms. Cd(II) adsorption capacity of coir pith was found to be 18.72 mg/g. Kinetic parameters of adsorption such as the Langergren pseudo-first-order, pseudo second order rate constant and the intraparticle diffusion rate constant were determined. Kinetic studies revealed that the adsorption process followed a pseudo-second order kinetic model.

Keywords: Activated Carbon, Adsorbent, Adsorption, Batch, Biosorbent, Biosorption, Cadmium, Cadmium, Coir Pith, Contamination, Dyes, Equilibrium, Freundlich, Heavy-Metal Ions, Isotherms, Kinetic, Kinetic Studies, Kinetics, Langmuir, pH, pH Effect, Removal, Sorption, Water, Zinc

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Full Text: 2011\Env Eng Man J10, 1743.pdf

Abstract: In this study, the adsorption mechanism of a reactive azo dye, Reactive Yellow 125 (RY 125), onto a nitrogen doped TiO2 modified zeolite (Z-TiO2-N) has been examined in order to identify the affinity of the material for the investigated pollutant envisaging its degradation by heterogeneous photocatalysis. Equilibrium experiments were performed and the data obtained were fitted with different isotherm equations, i.e., Langmuir, Freundlich, and Dubinin-Radushkevich (D-R). The Freundlich isotherm gave the best description of the adsorption process with a correlation coefficient of 0.8963. Adsorption kinetics has been studied in terms of pseudo-first-order, pseudo-second-order and intra-particle diffusion models. The results showed that pseudo-second-order kinetic model is the most appropriate to describe the uptake process satisfactorily. All determined equilibrium and kinetic parameters showed that the process is mainly governed by a physical mechanism rather than an electrostatic attraction, as confirmed by Zeta potential measurements.

Keywords: Activated Carbon, Adsorption, Adsorption Kinetics, Aqueous-Solution, Azo Dyes, Dubinin-Radushkevich, Equilibrium, Freundlich, Isotherm, Kinetic, Kinetics, Langmuir, Mechanism, Models, Nitrogen Doped TiO2, Photocatalytic Degradation, Photochemical Degradation, Reactive Yellow 125, Removal, Sorption, Systems, Uptake, Zeolite, Zeta Potential

? Zelmanov, G. and Semiat, R. (2011), Phosphate removal from water and recovery using iron (Fe+3) oxide/hydroxide nanoparticles-based agglomerates suspension (Aggfe) as adsorbent. *Environmental Engineering and Management Journal*, **10** (12), 1923-1933.

Full Text: 2011\Env Eng Man J10, 1923.pdf

Abstract: An iron (Fe+3) oxide/hydroxide nanoparticles-based agglomerates (AggFe) suspension adsorbent was synthesized for efficient, cost-effective phosphate removal. A strong effect of AggFe concentration and pH level of water containing phosphate on removal efficiency was shown. It was found that phosphate adsorption onto the AggFe suspension may be described by pseudo-second-order reaction kinetics and the Langmuir isotherm model. The unique adsorption properties of synthesized AggFe adsorbent are demonstrated. This technique achieved a residual phosphate concentration of less than 0.05ppm as PO(4) (<20 ppb as P), which is acceptable by water quality regulations, and at least 95-99% regeneration efficiency of the phosphate with the proposed adsorbent. The phosphate adsorption capacity on the AggFe at an equilibrium concentration of 0.1ppm as P in the solution is about 1.5-1.9 times higher than these values for granulated ferric hydroxide (fraction <63 mu m) and more than one order of magnitude higher than other values reported in the literature. This technique enables recovery of the adsorbent while producing a concentrated phosphate solution that may be treated further to obtain phosphate crystals while recovering the cleaning solution.

Keywords: Activated Carbon, Adsorbent, Adsorption, Adsorption, Adsorption Properties, Agglomerates, Aluminum-Oxide, Aqueous-Solutions, Calcium-Phosphate, Concentration, Equilibrium, Fly-Ash, Iron(Fe(+3)) Oxide-Hydroxide, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, pH, Phosphate, Phosphorus Recovery, Recovery, Red Mud, Regeneration, Removal, Struvite Precipitation, Suspension, Waste-Water, Water Purification

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? Li, Z.H. and Bowman, R.S. (1998), Sorption of chromate and PCE by surfactant-modified clay minerals. *Environmental Engineering Science*, **15** (3), 237-245.

Full Text: [1998\Env Eng Sci15, 237.pdf](1998/Env%20Eng%20Sci15,%20237.pdf)

Abstract: Negatively charged clay mineral and zeolite surfaces have a strong affinity for cationic surfactants. Surfactant-modified clay minerals enhance sorption of nonionic organic compounds (NOCs) from aqueous solution due to their increased organic carbon content, Sorption of hexadecyltrimethy ammonium (HDTMA) cation by clay minerals and zeolite can far exceed the cation exchange capacities (CEC) of these minerals, up to 200% of the CEC for nonswelling clay minerals such as kaolinite and illite, and up to 250% of the CEC for swelling clay minerals such as smectite, The sorption of HDTMA by clay minerals follows a Langmuir isotherm, At the sorption plateau, the sorbed HDTMA molecules form a bilayer on the surface of the clay minerals and reverse the surface charge, which is responsible for the sorption of oxyanions such as chromate, The sorption of chromate by HDTMA-modified clay minerals also follows a Langmuir isotherm, while the sorption of perchloroethylene (PCE) follows a linear isotherm, The ratio of the amount of chromate sorbed to that of counterion (bromide) desorbed is close to 1:2, indicating that chromate sorption is mainly due to anion exchange, The organic carbon based partition coefficient K-oc for PCE varies with the surface density of the surfactant bilayer, which is controlled by the mineral’s surface charge density, The dual sorption of chromate and PCE by surfactant-modified clay minerals extends their application to the removal of anions as well as hydrophobic organics from contaminated water.

Keywords: Adsorption, Ammonium, Carbon, Carbon Content, Cationic Surfactant, Chromate, Clay, Clay Minerals, Clinoptilolite, Contaminants, Contaminated Water, Density, Equilibria, HDTMA, Hexadecyltrimethylammonium, Hexadecyltrimethylammonium, Ionic Organic-Compounds, Isotherm, Langmuir Isotherm, Layer Silicates, Mineral, Organic, Organic Carbon, Organic Compounds, Organics, Partition, Perchloroethylene (PCE), Sediments, Sorbed, Sorption, Surfaces, Surfactant, Surfactants, Swelling, Water, Zeolite

Desroches Ducarne, E., Marty, E., Martin, G., Delfosse, L. and Nordin, A. (1998), Effect of operating conditions on HCl emissions from municipal solid waste combustion in a laboratory-scale fluidized bed incinerator. *Environmental Engineering Science*, **15** (4), 279-289.

Full Text: [1998\Env Eng Sci15, 279.pdf](1998/Env%20Eng%20Sci15,%20279.pdf)

Abstract: The effect of operating conditions on hydrogen chloride emissions were determined for municipal solid waste combustion in a laboratory-scale fluidized bed incinerator, Experiments were performed according to a statistical experimental design, to examine the effect of bed temperature, limestone feeding rate, excess air, and fuel moisture, The amount of HCl emitted was found to be significantly decreased by limestone addition and slightly increased by bed temperature and waste moisture growth, Capture efficiencies as high as 55-70% without limestone, and 95% with a calcium to chlorine and sulphur ratio of 5.0 was obtained, despite the fact that CaCl2 is not thermochemically stable in the fluidized bed, A comparison with results from a corresponding chemical equilibrium analysis suggested that the high capture efficiency could be either (1) reactions with calcium containing aerosols and particles downstream of the hot reactor, or (2) high-temperature reactions involving complex liquid (or solid) solutions of more stable products.

Keywords: HCl Emissions, Municipal Solid Waste, Incineration, Fluidized Bed, Statistical Design, Sulfation, Kinetics, Optimization, Limestone, Sorbents, Fuel

Mangialardi, T., Piga, L., Schena, G. and Sirini, P. (1998), Characteristics of MSW incinerator ash for use in concrete. *Environmental Engineering Science*, **15** (4), 291-297.

Full Text: [1998\Env Eng Sci15, 291.pdf](1998/Env%20Eng%20Sci15,%20291.pdf)

Abstract: The incinerator ash, the fine residue resulting from the burning of municipal solid waste (MSW), has been characterized with a view to utilizing the material to replace part of the Portland cement normally used for making concrete. Characterization involved chemical and particle size analysis, observation under the scanning electron microscope (SEM), thermal analysis (TG/DTA) both in air and argon, and XRD analysis, Leaching tests in neutral and acid media were also run to assess whether this material is likely to release heavy metals into the environment. Blended cements were prepared by mixing a Portland cement with various amounts of ash, Mortars made of samples of Portland and blended cements were tested to ascertain compressive and flexural strength, It ensues from consideration of the chemical and physical characteristics of the ash, as well as the mechanical properties of the mortars produced, that after preliminary washing and/or grinding the material could, in fact, be used as partial replacement for Portland cement, although there is some slight reduction in the mechanical properties of the product.

Keywords: Incinerator Ash, Concrete, Municipal Solid Waste (MSW)

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Full Text: [1998\Env Eng Sci15, 299.pdf](1998/Env%20Eng%20Sci15,%20299.pdf)

Abstract: The behaviors of hazardous and radioactive metals in analytical and real combustion conditions were observed to understand their vaporization and to predict their release into the atmosphere at a real incineration plant, In the laboratory furnace experiment, vaporization fluxes were obtained based on the measurement of weight losses with temperatures, Vaporization fluxes were compared to maximum theoretical fluxes obtained from the Herz-Knudsen’s kinetic theory of gas, The vaporization coefficient, alpha, for volatile metal chloride appears to be a characteristic value of the evaporating substance, not varying with increasing temperatures. With some theoretical considerations on interfacial equilibrium, mass transfer coefficient of vaporization, K-G, was determined as a function of absolute temperature, To evaluate the behavior of metals and radionuclides in an incinerator and off-gas treatment system, test burns of simulated waste containing several toxic metals and radioisotopes were performed at the demonstration-scale incineration plant, The previously analyzed characteristics of volatilization of hazardous metals and radioactive nuclides were used to explain their distributions in the demonstration plant, The decontamination factor for low-volatility species was above 105, which was equivalent to the removal efficiency of particulate matter in the plant, The factors for semivolatile components were in the range between 102 and 104, showing the strong dependency on volatility.

Keywords: Metal, Radionuclide, Volatility, Incineration, Removal Efficiency, Waste Incineration, Lead, Combustion

Zhang, T.C. and Emary, S.C. (1999), Jar tests for evaluation of Atrazine removal at drinking water treatment plants. *Environmental Engineering Science*, **16** (6), 417-432.

Full Text: [1999\Env Eng Sci16, 417.pdf](1999/Env%20Eng%20Sci16,%20417.pdf)

Abstract: The objective of this study was to evaluate the effects of major factors such as PAC dosage, pH, contact time, mixing energy, alum dosage, and enhanced coagulation on the effectiveness of atrazine removal, J.A.r tests and response surface methodology were used to simulate conditions found in different treatment facilities. The time course of atrazine concentration with an initial atrazine concentration of 12 µg/L and initial (Acticarb) PAC of 16 mg/L, indicated that it took approximately 5 days to reach equilibrium with the maximum atrazine removal of about 73%, Therefore, in treatment facilities, the adsorption of atrazine with this kind of PAC will be less than the removal achieved at equilibrium, due to the short retention time in a dynamic process, Mixing energy is a major factor affecting atrazine absorption, With jar test times ranging from 30 to 60 min, increasing rpms from 5 to 100 (G = 4 to 321 s-1) resulted in atrazine removals ranging from 34 to 59%. Without addition of PAC, neither lime softening nor alum coagulation (conventional or enhanced dosages ranging from 6 to 18 mg/L) demonstrated atrazine removal, A. synergistic relationship appears to exist between PAC dosage and enhanced coagulation (with pH adjusted to about 5.8), neither PAC nor enhanced coagulation resulted in as high a removal rate of atrazine as the two did together (greater than 60%). The results of this study are useful for evaluation of different PAC application points in conventional drinking water treatment plants.

Keywords: Powdered Activated Carbon, Enhanced Coagulation, Haberer Process, Adsorption, PAC, Verification, Flocculation, Precursors, Organics, System, Atrazine, Powdered Activated Carbon (PAC), J.A.R. Tests

Lackovic, J.A., Nikolaidis, N.P. and Dobbs, G.M. (2000), Inorganic arsenic removal by zero-valent iron. *Environmental Engineering Science*, **17** (1), 29-39.

Full Text: [2000\Env Eng Sci17, 29.pdf](2000/Env%20Eng%20Sci17,%2029.pdf)

Abstract: Zero-valent iron can be used to remove inorganic arsenic from aqueous solutions. The mechanism for arsenic removal appears to be a surface precipitation or adsorption of arsenic with iron. This mechanism differs significantly from the removal mechanisms of chlorinated hydrocarbons (reductive dechlorination) and chromium(VI) reduction accompanied by hydroxide precipitation. Arsenic removal efficiencies of greater than 95% are observed in laboratory and field-column studies. Arsenate is removed more effectively than arsenite, however, effective arsenite removal occurs even under anoxic conditions. The removal efficiency is related to the surface area or the type of iron used and improved over time, possibly due to pitting of the iron surface and increased surface area for sorption due to iron corrosion and ferrous iron adsorption/precipitation. Preliminary results indicate that arsenic is tightly bound to the iron filings, and only a small percentage is readily leached. This finding coupled with the results of field experiments and spectroscopic analysis (SEM/EDX and XPS) provide evidence that surface precipitation is the predominant removal mechanism.

Keywords: 6 Districts, Adsorption, Affected People, Analysis, Anoxic, Arsenic, Arsenic Removal, Arsenite, Calamity, Chlorinated Hydrocarbons, Chromium(VI), Corrosion, Dechlorination, Drinking-Water, Efficiency, Ferrihydrite, Ferrous Iron, Ground-Water, Hydrocarbons, In-Situ Remediation, Inorganic, Iron, Mechanism, Mechanisms, Precipitation, Reduction, Removal, Removal Efficiency, Removal Mechanism, Sorption, Surface, Surface Area, Surface-Chemistry, West-Bengal, XPS, Zero-Valent Iron

Chu, K.H. and Hashim, M.A. (2004), Quantitative analysis of copper biosorption by the microalga *Chlorella vulgaris*. *Environmental Engineering Science*, **21** (2), 139-147.

Full Text: [E\Env Eng Sci21, 139.pdf](E/Env%20Eng%20Sci21,%20139.pdf)

Abstract: In this study we have investigated the kinetics of copper removal by inactivated biomass of *Chlorella vulgaris*, a green microalga, in batch systems. A dual resistance rate model incorporating intrinsic adsorption kinetics and film diffusion was used to assess the relative importance of the two rate processes under varying experimental conditions. Intraparticle diffusion was not accounted for in this model since metal uptake by nonliving algal biomass is a passive nonmetabolically mediated process and is, therefore, a surface binding phenomenon. Modeling results have found that film diffusion appears to be the ratelimiting step at low initial metal concentrations. On the other hand, both the intrinsic adsorption kinetics and film diffusion are likely to control the overall rate of adsorption at high initial metal concentrations. The model described in this study can thus be used for predicting if and under which conditions the metal adsorption process could sufficiently be described by single resistance models.

Keywords: Algae, Biosorption, Heavy Metals, Kinetics, Modeling

? Schaefer, C.E., Fuller, M.E., Lowey, J.M. and Steffan, R.J. (2004), Use of peat moss amended with soybean oil for mitigation of dissolved explosive compounds leaching into the subsurface: Insight into mass transfer mechanisms. *Environmental Engineering Science*, **22** (3), 337-349.

Full Text: [2004\Env Eng Sci22, 337.pdf](2004/Env%20Eng%20Sci22,%20337.pdf)

Abstract: Peat moss and soybean oil are proposed as potential amendments for mitigating the dissolved transport of energetic compounds from military training facilities. Laboratory column experiments were performed to evaluate the migration of 2,4,6-trinitrotoluene (TNT), hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX), and octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazoeine (HMX) through peat moss and peat moss amended with soybean oil. Results indicated that uptake into the sorbents significantly reduced the migration of these compounds, and that uptake into the peat was mass transfer limited. Addition of the soybean oil had a neglible effect on the transport of RDX and HMX, but had a significant impact on the transport of TNT through the columns. The relatively large impact of soybean oil on TNT transport was due, in part, to enhanced biotransformation of TNT. The TNT biotransformation rate constant in the presence of soybean oil was approximately 10 times greater than in the presence of peat alone, and at least 10 times greater than the biotransformation rate constant of RDX or HMX. The presence of the soybean oil also increased the rate of TNT mass transfer to kinetically controlled sorption sites, resulting in an overall decrease in TNT flux from the peat plus soybean oil columns. A diffusion model incorporating the effects of liquid viscosity and soybean oil-water contaminant partitioning was shown to accurately describe the impact of soybean oil addition on the transport of energetic compounds, indicating that mass transfer limitations in peat moss are the result of liquid phase diffusion, and that the presence of nonaqueous phase liquids affect sorption kinetics.

Keywords: Explosives, TNT, RDX, HMX, Peat, Diffusion, Biotransformation, Mass Transfer, Model Development, Military Facilities, Surface Soils, Sorption, Desorption, Transport, Contaminants, Degradation, Attenuation, Isotherms

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Full Text: [2006\Env Eng Sci23, 923.pdf](2006/Env%20Eng%20Sci23,%20923.pdf)

Abstract: The emission characteristics of aromatic and aliphatic volatile organic compounds (VOCs) produced by two kinds of surfactants, nonionic Triton X-100 (TX-100) and cationic domiphen bromide (DB), washing high and low soil organic matter (SOM) soils were evaluated with two mass-balance equations. The influential factors on volatilization mass were primarily related to the affinity of the VOCs to the soils and to the surfactant solutions. The results show that the VOC emissions are a function of Koc, the surfactant properties and the S-w and P of the VOC. Nonionic surfactants could more effectively wash the VOCs away from the soil, leading to relatively higher emissions. When the surfactant concentrations exceeded the critical micelle concentrations (CMCs), VOC partitioning into the surfactant sorbed on the soil surface to reduce the VOC emissions. Whether the VOC can freely dissolve in the solution is the key point in determining the volatilization parameters. The emission of dissolved VOC is dependent on K-OL and S-w. The P is the major parameter governing the emission of VOCs in an insoluble state. The solution properties can strongly affect the emissions of low S-w compounds due to solubility enhancement effects. The main effects on higher S-w compound emissions were the amounts of the surfactants adsorbing on the soil surface.

Keywords: Cationic Surfactant, Chemicals, Cmc, Cosolute Effect, Downwind Concentrations, Nonionic Surfactant, Partition, Sorption, Surfactant, System, Turbulence, VOC, Volatilization, Volatilization Rates, Washing Soil, Water

? Gu, Z.M. and Deng, B.L. (2007), Use of iron-containing mesoporous carbon (IMC) for arsenic removal from drinking water. *Environmental Engineering Science*, **24** (1), 113-121.

Full Text: [2007\Env Eng Sci24, 113.pdf](2007/Env%20Eng%20Sci24,%20113.pdf)

Abstract: While great progress has been made in nanotechnology in recent years, application of engineered nanomaterials to environmental protection has been less explored. In this study, iron-containing mesoporous carbon (IMC) was prepared from a silica template (MCM-48) for effective removal of arsenic from drinking water. The synthesis began with in situ polymerization of resorcinol with formaldehyde (RF) in the porous structure of the silica template in a basic aqueous solution, followed by carbonization in an inert atmosphere and template removal. The IMC was obtained by impregnating ferrous chloride into mesoporous carbon followed by sodium hypochloride oxidation. Prepared IMC had a BET specific surface area of 401 m2/g, slightly lower than the surface area of 503 m2/g for the mesoporous carbon. Transmission Electron Microscopy micrographs showed the existence of mesoporous structure in IMC. The adsorption of arsenic (As-III and As-V) from drinking water by IMC followed the Langmuir adsorption model, with the adsorption maximum reaching 5.96 mg As/g for arsenite and 5.15 mg As/g for arsenate. Based on the amount of impregnated iron and the maximum arsenic adsorption, the calculated molar ratio of iron and arsenic was 7.81-8.40. A pseudosecond-order adsorption kinetic model can fit the adsorption data well.

Keywords: Iron-Containing Mesoporous Carbon (IMC), MCM-48, Silica Template, Arsenic Removal, Drinking Water, Template Synthesis, Activated Carbon, Silica, Adsorption, Transformation, Surfactants, Mechanisms, Kinetics

? Chevalier, L.R., Yesuf, J.N. and Knowles, L.S. (2007), Evaluation of textile dye sorption on GAC produced from almond shells based on optimized isotherm models. *Environmental Engineering Science*, **24** (4), 563-579.

Full Text: [2007\Env Eng Sci24, 563.pdf](2007/Env%20Eng%20Sci24,%20563.pdf)

Abstract: Single component sorption of three basic dyes used by the textile industry (rhodamine b, malachite green oxalate, and methylene blue) from aqueous systems was evaluated for granular activated carbon produced from the acid activation of almond shells. Dye sorption was compared to sorption on a commercially available activated carbon, Filtrasorb 400. Results suggested that sorption onto granular activated carbon from almond shells is comparable to sorption onto Filtrasorb 400 for the basic dyes studied. Existing predictive and correlative models were used to estimate equilibrium sorption from batch experiments. Parameter estimation was performed using spreadsheet optimization and a range of error functions, consequently allowing for a broader mathematical approach to model development.

Keywords: Isotherms, Sorption, Textile Dyes, Almond Shells, Carbon, Granular Activated Carbons, Aqueous-Solutions, Adsorptive Removal, Component Systems, Acidic Dyes, Fly-Ash, Single, Equilibrium, Copper, Cost

? Kargi, F. and Cika, S. (2007), Kinetics of zinc(II) ion biosorption onto powdered waste sludge (PWS) at different operating conditions. *Environmental Engineering Science*, **24** (5), 687-695.

Full Text: [2007\Env Eng Sci24, 687.pdf](2007/Env%20Eng%20Sci24,%20687.pdf)

Abstract: Batch biosorption kinetics of zinc(II) ions onto powdered waste sludge (PWS) were investigated under different experimental conditions such as variable pH (3-6), temperature (30-50°C), Zinc ion (50-350 mg L-1) and PWS (0.25-3 g L-1) concentrations and PWS particle size (53-231 μm). The rate and the extent of zinc(II) biosorption increased with pH yielding pH 5 (q(m) = 60 mg g-1) as the optimal value without Zn(OH)2 precipitation. Increases in temperature also resulted in increases in biosorption rate with an activation energy of 6 kcal mol-1 according to the second-order kinetics. Maximum biosorbed Zn(II) concentration was 72 mg g-1 at 50°C. Biosorbed zinc(II) concentration at the end of 6 h of incubation increased with increasing zinc(II) concentration (q(m) = 95 mg g-1 at 300 mg L-1 Zn), but with decreasing particle size (q(m) = 70 mg g-1 with D-p = 53 μm) and concentration of PWS (q(m) = 168 mg g-1 with PWS of 0.25 g L-1). Pseudo first- and second-order kinetics were used for correlation of biosorption data and for determination of the rate constants. The pseudosecond-order kinetics was found to be more suitable for representation of the kinetic data for almost all cases due to similarity between the adsorption kinetics and bimolecular reactions. Kinetic constants increased with increasing pH, temperature, and PWS concentration, but decreased with increasing zinc(II) concentrations and the particle size of PWS. The highest rate constants for the pseudofirst-and second-order kinetics were 0.71 h-1 and 0.024 (mg/g)-1 h-1, respectively, for the smallest particle size of 53 mu m. The highest Zn(II) biosorption capacity of 168 mg g-1 was obtained with PWS and Zn(II) concentrations of 0.25 g L-1 and 100 mg L-1 at the end of 6 h biosorption period.

Keywords: Activated-Sludge, Activation, Activation Energy, Adsorption, Adsorption Kinetics, Batch, Biomass, Biosorption, Biosorption Kinetics, Capacity, Chromium(VI), Concentration, Concentrations, Correlation, Determination, Energy, Heavy-Metal Biosorption, Ion, Kinetic, Kinetics, Operating Conditions, Particle, Particle Size, pH, Powdered Waste Sludge (PWS), Precipitation, Removal, Representation, Second Order, Second Order Kinetics, Second-Order Kinetics, Similarity, Sludge, Temperature, Waste, Zinc(II), Zinc(II) Ions, Zn, Zn(II)

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Full Text: [Env Eng Sci24, 998.pdf](2007/Env%20Eng%20Sci24,%20998.pdf)

Abstract: Advanced oxidation processes (AOP) are commonly used to treat contaminated groundwaters for a variety of synthetic organic chemicals (SOCs), including those contaminated with fuel oxygenates. To facilitate modeling oxygenate removal with advanced oxidation processes, kinetic rate constants are needed for hydroxyl radicals and specific oxygenates. In this work, hydroxyl radical rate constants were determined for a suite of fuel oxygenates and byproducts-methyl tert-butyl ether (MTBE), ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME), diisopropyl ether (DIPE), tert-butyl formate (TBF), and tert-butyl alcohol (TBA)-using a uniform methodology. Rate constants were determined with the competitive kinetic technique using para-chlorobenzoic acid (pCBA) as the radical probe and the UV/hydrogen peroxide AOP for radical generation. The second-order rate constants determined for MTBE, ETBE, TAME, DIPE, TBF, and TBA were 1.27 (+/- 0.04) (10(9)), 2.46 (+/- 0.8) (10(9)), 2.80 (+/- 0.2) (10(9)), 3.01 (+/- 0.06) (10(9)), 5.6 (+/- 0.8) (10(8)), and 7.3 (+/- 0.2) (10(8)) M-1 center dot s-1, respectively.

Keywords: Acid, Advanced Oxidation, Advanced Oxidation Processes, Alcohol, AOP, Butanol, Carbon Adsorption, Chemicals, Constants, Degradation, ETBE, Formate, Fuel Oxygenates, Generation, Hydrogen-Peroxide, Hydroxy Radical Rate Constants, Hydroxyl, Hydroxyl Radical, Hydroxyl Radicals, Kinetic, Kinetic Rate, Methodology, Modeling, MTBE, Organic, Organic Chemicals, Oxidation, Oxygenates, Ozone, Peroxide, Physical-Dependence, Probe, Radical, Radicals, Rate, Rate Constants, Removal, Second Order, SOCS, Synthetic, TBA, TBF, Tert-Butyl Alcohol, Tert-Butyl Ether, Water-Treatment

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Full Text: [2008\Env Eng Sci25, 519.pdf](2008/Env%20Eng%20Sci25,%20519.pdf)

Abstract: TNT was prepared via a hydrothermal method and subsequently washed with a 10-4 N HCl aqueous solution. The prepared TNT was then mediated with a quaternary amine, hexadecyltrimethylammonium (HDTMA) chloride, through the cation exchange process. The revolution of both the surface area and pore structure of TNT was characterized based on the classical and fractal analyses of the nitrogen adsorption-desorption isotherms as well as the X-ray diffraction (XRD) patterns. The change in surface characteristics of TNT was identified with the Fourier transform infrared (FTIR) patterns and zeta potential plots. The adsorption isotherms of an acid dye, Acid Red 1 (AR1), on the HDTMA-modified TNT (HMTNT) samples were then measured to understand the effects of surfactant modified process on the adsorption properties of TNT. It was found that HDTMA-mediated process might decrease the BET surface area, pore size, pore volume, and surface fractal dimension of TNT. On the other hand, the hydrophobic bonding by conglomeration of large C-16 alkyl groups associated with HDTMA could render a positive charge development on the surface of TNT. The effects of the alteration of the surface characteristics of TNT on its adsorption selectivity for acid dye were discussed.

Keywords: Acid Dye, Adsorption, Basic-Dyes, Cation Exchange, Cationic Surfactant, Clay, Dye Removal, Ion Exchange, Low-Cost Adsorbents, Microstructures, Modified Montmorillonite, Pore Structure, Sorption, Surfactant, Temperature, Titanate Nanotubes, Waste-Water

? Yin, J., Liu, L., Zhang, L.G. and Liu, Z.S. (2008), Utilization of furnace ash and slags for adsorption of nitrobenzene from groundwater. *Environmental Engineering Science*, **25** (5), 643-648.

Full Text: [2008\Env Eng Sci25, 643.pdf](2008/Env%20Eng%20Sci25,%20643.pdf)

Abstract: In order to find a low-cost adsorbent for removal of nitrobenzene from groundwater, we prepared samples containing nitrobenzene with groundwater typical in Jilin province, used pretreated furnace ash and slags as adsorbents, measured heavy metals leached out from furnace ash and slags and investigated adsorptivity of nitrobenzene on the adsorbents. While the experimental results indicate that the equilibrium data are well modeled with the pseudo-second-order kinetic model for all adsorbents, the intraparticle diffusion model can be only applied to furnace ash. Furnace ash has a larger adsorption capacity than furnace slags due to its relatively larger specific surface area. According to the Freundlich isotherm model, furnace ash and slags with the grain size below 1.25 mm represent beneficial adsorption for nitrobenzene, but slags of other grain sizes do not represent beneficial adsorption; however, their correlation coefficients can be improved using the modified Freundlich model. Disposal of furnace ash and slags can be made safe by calcination at 300°C for 1 h. Through cost-effectiveness analysis, we come to the conclusion that furnace ash and slags can be only used for the remediation of water or groundwater, and furnace ash can be used as a low-cost adsorbent if the removal of turbidity and leachable heavy metals are considered beforehand.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Analysis, Aqueous-Solution, Calcination, Capacity, Cost Effectiveness, Cost-Effectiveness, Cost-Effectiveness Analysis, Degradation, Diffusion, Diffusion Model, Equilibrium, Experimental, Freundlich, Freundlich Isotherm, Freundlich Model, Furnace Slag, Groundwater, Heavy Metals, Intraparticle Diffusion, Intraparticle Diffusion Model, Ions, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Lead Removal, Low Cost Adsorbent, Low-Cost Adsorbent, Metals, Model, Nitrobenzene, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Remediation, Removal, Size, Sludge Ash, Specific Surface, Surface Area, Waste-Water, Water

? Khambhaty, Y., Mody, K., Basha, S. and Jha, B. (2009), Biosorption of inorganic mercury onto dead biomass of marine *Aspergillus niger*: kinetic, equilibrium, and thermodynamic studies. *Environmental Engineering Science*, **26** (3), 531-539.

Full Text: [2009\Env Eng Sci26, 531.pdf](2009/Env%20Eng%20Sci26,%20531.pdf)

Abstract: Large numbers of reports are available on metal binding capacity of different groups of microorganisms. However, reports on the equilibrium and thermodynamic studies on biosorption process are few. The present study was carried out in a batch system using dead biomass of marine *Aspergillus niger* for the sorption of Hg(II). Preliminary experiments revealed that removal rate of Hg(II) was maximum at pH 3. A. niger exhibited the highest Hg(II) uptake of 40.53 mg/g of biomass at pH 3 and 40 C. Kinetic studies reveal that pseudo-second order model showed best fit to experimental data. Two linear portions in the plot q(t) (mg/g) vs t(1/2) (min(1/2)) indicate the existence of an intraparticular diffusion resistance in the sorption process. Experimental sorption data were analyzed using four and three, two-parameter models (Langmuir, Freundlich, Dubinin-Radushkevich, and Temkin) and three-parameter equilibrium models (Khan, Sips, and Toth), respectively. It was observed that Langmuir among two parameters models and, Sips among three parameter models, exhibited the best fit to the experimental data. Thermodynamic parameters on the biosorption (Delta G degrees, Delta H degrees, Delta S degrees) were also determined.

Keywords: Activated Carbon, Adsorption, Aqueous-Solutions, *Aspergillus niger*, Biosorption, Cadmium, Inorganic Mercury, Ions, Isotherms, Marine Fungi, Methyl Mercury, Removal, Sorption, Sorption Isotherm Models, Thermodynamics, Waste

? Xing, Y., Sun, X.M. and Li, B.H. (2009), Pyromellitic dianhydride-modified chitosan microspheres for enhancement of cationic dyes adsorption. *Environmental Engineering Science*, **26** (3), 551-558.

Full Text: [2009\Env Eng Sci26, 551.pdf](2009/Env%20Eng%20Sci26,%20551.pdf)

Abstract: Pyromellitic dianhydride (PMDA) grafted chitosan microspheres (PMDA-GLA-CTS) were prepared, and characterized by Fourier transform infrared spectroscopy (FTIR) and x-ray photoelectron spectroscopy (XPS). Due to the presence of a large number of carboxyl groups, the adsorption capacity of the PMDA-GLA-CTS for methylene blue (MB) and neutral red (NR) showed a significant increase compared with the unmodified microspheres. The maximum adsorption capacities were 935 and 909 mg g-1 for MB and NR, respectively, according to the Langmuir equation. Kinetics studies showed that the sorption rate was controlled by the chemisorption process. Sample analysis showed that the adsorbent can effectively remove the cationic dyes in printing and dyeing wastewater.

Keywords: Acid-Solutions, Adsorption, Anionic Dyes, Aqueous-Solution, Beads, Beta-Cyclodextrin, Biosorption, Chitosan, Kinetics, Mechanisms, Microspheres, Modification, Polymers, Pyromellitic Dianhydride, Removal

? Elouear, Z., Bouzid, J., Boujelben, N. and Ben Amor, R. (2009), Study of adsorbent derived from exhausted olive pomace for the removal of Pb2+ and Zn2+ from aqueous solutions. *Environmental Engineering Science*, **26** (4), 767-774.

Full Text: [2009\Env Eng Sci26, 767.pdf](2009/Env%20Eng%20Sci26,%20767.pdf)

Abstract: Batch experiments were performed to evaluate the effects of contact time, solution pH, and temperature on both lead and zinc adsorption onto exhausted olive pomace ash (EOPA) from aqueous solution. Equilibrium data were analyzed using Langmuir and Freundlich isotherm models to calculate isotherm constants. Kinetic studies showed that an equilibrium time of 2 h was required for the adsorption of Pb(II) and Zn(II) onto EOPA. Equilibrium adsorption is affected by the initial pH (pH(0)) of the solution. pH(0)=6.0 was found to be optimum for individual removal of Cd(II) and Ni(II) ions by EOPA. Adsorption tests of EOPA in synthetic wastewater revealed that the adsorption data of this material for lead and zinc ions were better fit to the Langmuir isotherm based on correlation coefficients. Monolayer sorption capacities of EOPA were 8.76 and 7.75mg g-1 for lead and zinc ions, respectively. Effect of temperature was investigated by determining isotherms at 10, 23, and 40°C. The enthalpy change (ΔH°), the free energy change (ΔG°), and the change in entropy (ΔS°) were calculated. They showed that adsorption of Pb2+ and Zn2+ on EOPA is an endothermic process. Results of this study suggest that EOPA may be a promising adsorbent for environmental remediation.

Keywords: Activated Carbon, Adsorption, Adsorption, Agricultural Waste, Batch Experiments, Copper, Equilibrium, Exhausted Olive Pomace Ash, Fly-Ash, Heavy-Metal Ions, Isotherms, Removal, Sewage-Sludge, Sorption, Thermodynamics, Toxic Metal Removal, Zinc

? Park, K.Y., Song, J.H., Lee, S.H. and Kim, H.S. (2010), Utilization of a selective adsorbent for phosphorus removal from wastewaters. *Environmental Engineering Science*, **27** (9), 805-810.

Full Text: [2010\Env Eng Sci27, 805.pdf](2010/Env%20Eng%20Sci27,%20805.pdf)

Abstract: In this study, a synthetic layered double hydroxide modified with chloride ions (LDH-Cl) was employed for the removal of phosphorus from wastewaters. A series of phosphate adsorption experiments demonstrated that the adsorption capacity of LDH-Cl was described well by the three-parameter isotherm model (Langmuir-Freundlich combination model). LDH-Cl was found to have similar to 50 mg P/g of ion exchange capacity for phosphate, which was sufficient for phosphate recovery from wastewaters. Phosphate adsorption by LDH-Cl also followed pseudo-second-order reaction kinetics. Effective replacement of Cl- with PO43- during sorption was confirmed by X-ray diffraction and Fourier transform infrared analyses. Adsorption capacity varied with pH and reached a maximum value at pH 3. Anions commonly present in most wastewaters, such as nitrate, sulfate, and chloride, had a minimal effect on phosphate adsorption by LDH-Cl. On the contrary, the amount of phosphate ions removed by LDH-Cl decreased with increasing bicarbonate ion concentration. LDH-Cl also exhibited a sufficient chemical stability against adsorption/desorption repetitions and similar to 80% of desorption rate was achieved at 5 M NaCl concentration. LDH-Cl exhibited a high phosphate removal capacity and a low sensitivity to the environmental conditions of wastewaters, supporting use as an effective means for the removal of phosphate.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Adsorption, Desorption, Adsorptive Removal, Analyses, Aqueous-Solutions, Capacity, Chemical, Chloride, Concentration, Desorption, Double Hydroxide, Environmental, Exchangers, Experiments, Ion, Ion Exchange, Ion Exchange Capacity, Ion-Exchange, Ions, Iron, Isotherm, Isotherm Model, Kinetics, Langmuir-Freundlich, Layered Double Hydroxide, Layered Double Hydroxides, Model, Modified, NaCl, Nitrate, pH, Phosphate, Phosphate, Phosphate Adsorption, Phosphate Removal, Phosphorus, Pseudo Second Order, Pseudo-Second-Order, Reaction Kinetics, Recovery, Removal, Removal of Phosphate, Secondary Effluent, Selectivity, Sensitivity, Sorption, Stability, Sulfate, Value, Waste-Water, Wastewaters, X-Ray, X-Ray Diffraction

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Full Text: [2010\Env Eng Sci27, 853.pdf](2010/Env%20Eng%20Sci27,%20853.pdf)

Abstract: Benzoic acid (BA) is a common pollutant in industrial wastewater. It has high toxicity and is a threat to human health and the ecosystem. Mg-Al-CO3 hydrotalcites (HTs) and their calcined products (CHTs) are good ion exchangers/adsorbents for removal of toxic anions from contaminated water. In this study, HTs with different Mg/Al molar ratios were prepared by coprecipitation method, and CHTs were obtained by calcining at 500ºC. Adsorption of BA by HTs and CHTs at different pH values was first investigated. Taking HT and CHT with an Mg/Al molar ratio of 2:1 as an example, adsorption kinetics and adsorption isotherms of BA by HT and CHT were analyzed, and impacts of adsorbent dosage and adsorption temperature on equilibrium adsorption quantities were studied. Results indicated that the maximum adsorption of HTs and CHTs could be obtained when the initial pH value of BA solution was 4.5, and equilibrium adsorption quantities significantly decreased with increase of pH value. Kinetic data of the adsorption of BA by HT and CHT with an Mg/Al molar ratio of 2:1 under an ambient temperature of 293 K could be fitted by pseudo-second-order equation. It was found that adsorption isotherms obeyed the Freundlich equation. Equilibrium adsorption quantities of BA by HT and CHT gradually decreased with increase of adsorbent added. Values of thermodynamic parameter (ΔHº) indicated that the adsorption of BA was endothermic on HT and was exothermic on CHT. Different adsorption mechanisms of BA on HT and CHT were revealed. Results showed that CHT could be used as an effective adsorbent to remove BA from waste water. This not only provides a new way to remove BA, but also enlarges the application field of CHT.

Keywords: 2,4-D, Activated Carbon, Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Adsorption Mechanisms, Anions, Application, Aqueous-Solution, Behavior, Benzoic Acid, Breakthrough Curves, Calcined, Coprecipitation, Data, Dye, Ecosystem, Endothermic, Equilibrium, Exothermic, Field, First, Freundlich, Freundlich Equation, Health, Human, Human Health, Hydrotalcite, Hydrotalcites, Impacts, Industrial Wastewater, Isotherms, Kinetic, Kinetics, Layered Double Hydroxides, Mechanisms, pH, pH Value, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Equation, Removal, Solution, Sorption, Temperature, Thermodynamic, Thermodynamic Parameter, Thermodynamics, Toxic, Toxicity, Value, Waste, Waste Water, Wastewater, Water

? Li, M.Y., Zhu, X.Q., Lin, D.H., Chen, W.L. and Ren, G. (2011), Cadmium(II) removal by modified zeolite from micro-polluted water. *Environmental Engineering Science*, **28** (10), 735-741.

Full Text: [2011\Env Eng Sci28, 735.pdf](2011/Env%20Eng%20Sci28,%20735.pdf)

Abstract: Cadmium(II) in water sources has threatened the availability of safe drinking water and, thus, human health. Therefore, development of a feasible technique for cadmium(II) removal from micro-polluted water is urgently needed. In this study, modified zeolite powder, a new adsorbent, was prepared from natural zeolite powders, chitosan, and sodium hydroxide and was analyzed by Fourier transform infrared spectroscopy and scanning electron microscopy. It was used to remove cadmium(II) from a micro-polluted water source. The effect of adsorption time, pH, initial cadmium(II) concentration, and zeolite powder dosages on the removal of cadmium( II) was investigated. Results show that the cluster structures became porous structures in the modified zeolite powder. Chitosan was supported on the zeolite. The process formed porous structures with a large inner specific surface area. Under the experimental conditions, maximum cadmium(II) adsorption capacities were 0.159mg center dot g(-1) for the natural zeolite powder and 1.011mg center dot g(-1) for the modified zeolite powder. Cadmium(II) was more effectively removed by the modified zeolite powder than by natural zeolite powder. Equilibrium adsorption data were analyzed by Langmuir, Freundlich, and Dubinin-Kaganer-Radushkevich isotherm models. A pseudo second-order adsorption kinetics model was used to describe the adsorption processes.

Keywords: Adsorbent, Adsorption, Adsorption Kinetics, Aqueous-Solutions, Cadmium(II), Cations, Chitosan, Chitosan, Clinoptilolite, Drinking Water, Electron Microscopy, Equilibrium, Freundlich, Isotherm, Kinetics, Langmuir, Micro-Polluted Water, Modified, Modified Zeolite Powder, Natural Zeolites, pH, Pseudo Second Order, Regeneration, Removal, Waste-Water, Water, Zeolite

# Title: Environmental Entomology

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Language: English

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Publisher Address: 9301 Annapolis Rd, Lanham, MD 20706

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Entomology: Impact Factor 1.801, / (2000)

? Jones, V.P., Anderson-Wong, P., Follett, P.A., Yang, P.J., Westcot, D.M., Hu, J.S. and Ullman, D.E. (2000), Feeding damage of the introduced leafhopper Sophonia rufofascia (Homoptera: Cicadellidae) to plants in forests and watersheds of the Hawaiian islands. *Environmental Entomology*, **29** (2), 171-180.

Abstract: Experiments were performed to determine the role of the leafhopper Sophonia rufofascia (Kuoh & Kuoh) in damage observed on forest and watershed plants in the Hawaiian Islands. Laboratory manipulation of leafhopper populations on fiddlewood, Citharexylum spinosum L., caused interveinal chlorosis and vein browning on young fully expanded leaves similar to that observed on leafhopper infested plants seen in the field and necrosis on older leaves. Field studies with caged “uluhe” fern, Dicranopteris linearis (Burman), demonstrated that frond veins turned brown within 2 d of leafhopper feeding: and by 141 d after feeding, an average of 85% of the surface area of the fiends were necrotic compared with only 12% necrosis in untreated cages. Field trials with stump-cut firetree, Myrica faya Aiton, were performed to determine the effect of leafhopper feeding on new growth. Our studies showed that the new growth in exclusion cages had significantly greater stem length and diameter, a higher number of nodes, fewer damaged leaves, and almost twice as much leaf area compared with plants caged but with the sides left open to permit leafhopper access. Microscopic examination of sections through damaged areas of several leafhopper host plants showed vascular bundle abnormalities similar to those associated with hopperburn caused by potato leafhopper, Empoasca fabae (Harris), feeding on alfalfa. On Hawaiian tree fern, Cibotium splendens (Gaudichaud), oviposition into the midvein also disrupted vascular bundle integrity and often caused death of the distal portions of the pinnule.

Keywords: Sophonia Rufofascia, Hopperburn, Insect-Plant Interactions, Insect Feeding Damage, Dicranopteris Linearis, Myrica Faya, Tissues

# Title: Environmental and Experimental Botany

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Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Plant Sciences: Impact Factor

Harper, J.A. (1991), Editor’s invited review: Reference accuracy in environmental and experimental botany. *Environmental and Experimental Botany*, **31** (4), 379-380.

Full Text: [E\Env Exp Bot31, 379.pdf](E/Env%20Exp%20Bot31,%20379.pdf)

Notes: highly cited

? Kahle, H. (1993), Response of roots of trees to heavy metals. *Environmental and Experimental Botany*, **33** (1), 99-119.

Full Text: [1993\Env Exp Bot33, 99.pdf](1993/Env%20Exp%20Bot33,%2099.pdf)

Abstract: The heavy metal burden with which tree roots have to cope originates either from natural metalliferous soils or from continuous man-made inputs to forest ecosystems. Considering the interconnections with external factors in the rhizosphere, the responses of roots of various tree species to root-applied Pb, Cd, Zn, Cu, Ni, Mn, and Hg are reviewed. Data on stimulation, but mainly on the depression, of growth parameters such as root elongation, biomass production, root initiation and root hair formation in relation to the architecture of the whole root system, are derived from dose-response experiments with moderate or excess metal supply to young trees using water, sand or soil culture. Assessment of heavy metal toxicity also includes results on the disturbance to the mineral nutrition of tree roots, Effective metal levels from experiments are compared to field concentrations in forest soils and trees. Counteracting strategies such as the phytochelatin response, tolerance mechanisms, or raising of the rhizosphere pH are discussed with respect to tree species and include the crucial role of mycorrhizae.

Keywords: Zinc Tolerance, Scleroderma-Flavidum, Lactarius-Rufus, Mycorrhizal Infection, Spruce Seedlings, Nickel Toxicity, Cadmium Uptake, Norway Spruce, Sitka-Spruce, Betula

Miller, M.W. (1996), My last on the accuracy of reference citations (or, the agony/ecstasy processes — reader’s choice!). *Environmental and Experimental Botany*, **36** (4), 361-363.

Full Text: [E\Env Exp Bot36, 361.pdf](E/Env%20Exp%20Bot36,%20361.pdf)

# Title: Environmental Geochemistry and Health

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Public, Environmental & Occupational Health: Impact Factor 0.239, 80/85 (1999),

Water Resources: Impact Factor 0.239, / (1999), Impact Factor 0.351, 40/47 (2000)

? Fuge, R. and Perkins, W. (1991), Aluminum and heavy-metals in potable waters of the north ceredigion area, MID-wales. *Environmental Geochemistry and Health*, **13** (2), 56-65.

Full Text: [1991\Env Geo Hea13, 56.pdf](1991/Env%20Geo%20Hea13,%2056.pdf)

Abstract: Routine monitoring of the public water supply in Aberystwyth revealed high levels of aluminium during November 1989. These levels were twelve times the EEC recommended level and three times the maximum permitted level. While the reservoirs supplying the region and the streams draining their upland peaty catchment areas generally contain moderate levels of Al, Al salts added as coagulating agents are a major source. There is also considerable variation of the Al in potable waters through the month of November 1989 for an Aberystwyth supply. Private supplies, from groundwaters, in the region generally contain low Al. While most drinking waters in the region contain low Pb, values close to the EEC limit have been recorded for some samples from older houses with Pb pipes, while a sample from a well supply in an old lead mining area contained three times the EEC limit. Despite the wide use of Cu piping for water supplies in the area, most values for this element in mains-water are low, with occasional higher values. However, many private supplies from spring sources are extremely Cu-rich and again levels of this element in a private supply showed a marked temporal variation during November 1989. Zinc levels in potable waters of the area are very variable. That most of the Zn in potable waters is derived from the dissolution of Cu pipes is evidenced by a strong correlation between Cu and Zn in these waters. A few Cd values of over 2 µg L-1 have also been recorded.

? Das, D., Samanta, G., Mandal, B.K., Chowdhury, T.R., Chanda, C.R., Chowdhury, P.P., Basu, G.K. and Chakraborti, D. (1996), Arsenic in groundwater in six districts of West Bengal, India. *Environmental Geochemistry and Health*, **18** (1), 5-15.

Full Text: [1996\Env Geo Hea18, 5.pdf](1996/Env%20Geo%20Hea18,%205.pdf)

Abstract: Arsenic in groundwater above the WHO maximum permissible limit of 0.05 mg l-1 has been found in six districts of West Bengal covering an area of 34 000 km2 with a population of 30 million. At present, 37 administrative blocks by the side of the River Ganga and adjoining areas are affected. Areas affected by arsenic contamination in groundwater are all located in the upper delta plain, and are mostly in the abandoned meander belt. More than 800 000 people from 312 villages/wards are drinking arsenic contaminated water and amongst them at least 175000 people show arsenical skin lesions. Thousands of tube-well water in these six districts have been analysed for arsenic species. Hair, nails, scales, urine, liver tissue analyses show elevated concentrations of arsenic in people drinking arsenic-contaminated water for a longer period. The source of the arsenic is geological. Bore-hole sediment analyses show high arsenic concentrations in only few soil layers which is found to be associated with iron-pyrites. Various social problems arise due to arsenical skin lesions in these districts. Malnutrition, poor socio-economic conditions, illiteracy, food habits and intake of arsenic-contaminated water for many years have aggravated the arsenic toxicity. In all these districts, major water demands are met from groundwater and the geochemical reaction, caused by high withdrawal of water may be the cause of arsenic leaching from the source. If alternative water resources are not utilised, a good percentage of the 30 million people of these six districts may suffer from arsenic toxicity in the near future.

Keywords: Arsenic, Arsenic Poisoning, Groundwater, West Bengal, Background Correction, Skin-Cancer, Water, Calcutta, Acid

Guo, H.R. and Valberg, P.A. (1997), Evaluation of the validity of the US EPA’s cancer risk assessment of arsenic for low-level exposures: A likelihood ratio approach. *Environmental Geochemistry and Health*, **19** (4), 133-141.

Full Text: [E\Env Geo Hea19, 133.pdf](E/Env%20Geo%20Hea19,%20133.pdf)

Abstract: Skin cancers associated with ingesting of arsenic have been documented since the 19th century. A study in the southwestern coastal area of Taiwan where people drank well water containing arsenic is generally recognised as providing the best data available for quantifying the risk, and the US Environmental Protection Agency (EPA) used these data to conduct a risk assessment of arsenic ingestion. However, the lowest exposure category in the Taiwan study included arsenic levels up to 290 µg L-1, which is nearly six times higher than the current EPA maximum contaminant level (MCL), 50 µg L-1. Therefore, the EPA risk assessment model extrapolated data on high-level exposures to generate risk estimates for low-level exposures. To evaluate the validity of this model, we conducted a quantitative review of epidemiological studies observing arsenic exposures below 290 µg L-1. A ratio of the likelihood of the EPA model being inappropriate to that of it being appropriate was calculated for each study population as a measurement of the validity of the EPA model. Although existing human data on low-level exposures are limited, the review suggested that the EPA model is unlikely to be able to predict the risk of skin cancer accurately when the arsenic exposure level is between 170 and 270 µg L-1.

Keywords: Arsenic, Cancer, Epidemiology, Risk Assessment, Drinking Water, Tubewell Water, West-Bengal, Well Water

Higgs, F.J., Mielke, H.W. and Brisco, M. (1999), Soil lead at elementary public schools: Comparison between school properties and residential neighbourhoods of New Orleans. *Environmental Geochemistry and Health*, **21** (1), 27-36.

Full Text: [E\Env Geo Hea21, 27.pdf](E/Env%20Geo%20Hea21,%2027.pdf)

Abstract: Soil studies, conducted in Maryland, Minnesota and Louisiana, have described the urban pattern of lead contamination. They have shown that the highest amounts of lead cluster within the interior of the largest cities. The results of the New Orleans urban patterns of distribution of soil lead provided the basis for further study. The hypothesis was tested that elementary school properties have the same pattern of soil lead contamination as their neighbouring residential communities. Thirty New Orleans Public Elementary Schools were selected for this study. Surface samples (2.5 cm or 1 inch depth) were collected from playgrounds and next to entrances of each school. Results showed that soil lead on school properties follows the same relative contamination patterns (p-value less than or equal to 10-5) as soil lead on residential properties of neighbouring communities. Schools however, have significantly lower lead contamination than the neighbouring residential properties. Inner-city school properties present a higher risk of soil lead exposure than mid and outer-city schools. Soils next to inner-city school entrances showed the highest lead, with 18.5% having concentrations over 400 µg g-1. Systematic landscaping around the school entrances would significantly reduce the hazard from lead dust contaminated soils.

Keywords: Elementary Schools, Inner-City Pb, Playground Contamination, Residential Property Pollution, Soil Lead, National-Health, United-States, Nhanes

Guo, H.R. and Tseng, Y.C. (2000), Arsenic in drinking water and bladder cancer: Comparison between studies based on cancer registry and death certificates. *Environmental Geochemistry and Health*, **22** (2), 83-91.

Full Text: [E\Env Geo Hea22, 83.pdf](E/Env%20Geo%20Hea22,%2083.pdf)

Abstract: Associations between arsenic in drinking water and bladder cancer in an area along the southwest coast of Taiwan have been documented for decades. Several ecologic studies were conducted to assess the dose-response relationships. Some of them used the National Cancer Registry Program to identify cancer cases, and some used death certificates. Whereas the cancer registry collects information on all patients no matter if they died of bladder cancer or not, the case ascertainment might be incomplete due to the fact that reporting of cases is not mandatory. Reporting of death, on the other hand, is strictly enforced by law, but patients who did not die of bladder cancer might not be identified. In order to assess the problems with both approaches, we conducted a study using both case identification mechanisms. A total of 243 townships with measurements of arsenic in drinking water were included in the analysis of cancer registry data, and death certificates were collected from 10 of those townships. In both analyses, the same measurements of arsenic made by the mercuric bromide stain method were adopted. Due to limitation of the method, all levels below 0.04 mg L-1 were combined as a single exposure category. The results were very much alike, both approaches detected statistically significant associations between high arsenic levels in drinking water (above 0.64 mg L-1) and occurrence of bladder cancer but did not find such associations for arsenic exposures at lower levels.

Keywords: Arsenic, Drinking Water, Bladder Cancer, Dose-Response Relation, Epidemiology, Essential Trace-Elements, Well Water, Malignant Neoplasms, Risk Assessment, Skin-Cancer, Mortality, Taiwan, Uncertainty, Exposure, Level

Sun, Q.Y., Lu, P. and Yang, L.Z. (2004), The adsorption of lead and copper from aqueous solution on modified peat-resin particles. *Environmental Geochemistry and Health*, **26** (2), 311-317.

Full Text: [E\Env Geo Hea26, 311.pdf](E/Env%20Geo%20Hea26,%20311.pdf)

Abstract: Raw peat was modified with sulfuric acid, then mixed modified with resin to prepare the modified peat resin particles. Using the batch experimental systems, the removal of heavy metals (copper and lead) on the modified peat - resin particles was investigated. The data of the adsorption isotherm could be fitted by the Langmuir equation well. The adsorption rate of heavy metals on modified peat - resin particles was very swift. The removal processes of heavy metals on modified peat - resin particles could be well described by pseudo-second order model. The adsorption rate of lead was affected by the initial heavy metal concentration, initial pH, particle size, agitation speed and particle mass. In the adsorption of heavy metals (lead and copper) on the modified peat - resin particles, ion exchange was the major reaction mechanism. Desorption data showed that the lead adsorbed by modified peat - resin particle could be desorbed by 0.5 N or 1.0 N HNO3. The desorption rate was swift. The experiments indicated that the modified peat - resin particles have great potential for the removal of heavy metals from wastewater.

Keywords: Adsorption, Adsorption Isotherm, Adsorption Rate, Concentration, Copper, Desorption, Heavy Metal, Heavy Metals, HnO3, Ion, Ion Exchange, Ions, Isotherm, Kinetics, Kinetics Model, Lead, Mechanism, Metal Removal, Metals, Model, Modified Peat-Resin Particle, Particle, Particle Size, Particles, pH, Reaction, Reaction Mechanism, Sorption, Speed, Sphagnum Moss Peat, Sulfuric Acid, Wastewater

? Polowczyk, I., Bastrzyk, A., Koźlecki, T., Sawiźski, W., Rudnicki, P., Sokołowski, A. and Sadowski, Z. (2010), Use of fly ash agglomerates for removal of arsenic. *Environmental Geochemistry and Health*, **32** (4), 361-366.

Full Text: [2010\Env Geo Hea32, 361.pdf](2010/Env%20Geo%20Hea32,%20361.pdf)

Abstract: The aim of this work is to investigate the application of fly ash adsorbent for removal of arsenite ions from dilute solution (100-1,000 ppm). Experiments were carried out using material from the “Turw” (Poland) brown-coal-burning power plant, which was wetted, then mixed and tumbled in a granulator to form spherical agglomerates. Measurements of arsenic adsorption from aqueous solution were carried out at room temperature and natural pH of fly ash agglomerates, in either a shaken flask or circulating column, to compare two different methods of contacting solution with adsorbent. Adsorption isotherms of arsenic were determined for agglomerated material using the Freundlich equation. Kinetic studies indicated that sorption follows a pseudo-second-order model. Preferable method to carry out the process is continuous circulation of arsenite solution through a column.

Keywords: Adsorbent, Adsorbents, Adsorbents, Adsorption, Adsorption Isotherms, Application, Aqueous Solution, Aqueous-Solution, Arsenic, Arsenic Adsorption, Arsenite, As(III), As(V) Removal, Cadmium, Column, Equilibrium, Fly Ash, Freundlich, Freundlich Equation, Immobilization, Ions, Isotherms, Kinetic, Kinetic Models, Kinetic Studies, Mechanism, Methods, Model, Natural, pH, Plant, Power, Power Plant, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Room Temperature, Si, Solution, Sorption, Temperature, Work

? Cha, J., Cui, M., Jang, M., Cho, S.H., Moon, D.H. and Khim, J. (2011), Kinetic and mechanism studies of the adsorption of lead onto waste cow bone powder (WCBP) surfaces. *Environmental Geochemistry and Health*, **33** (S1), 81-89.

Full Text: [2011\Env Geo Hea33, 81.pdf](2011/Env%20Geo%20Hea33,%2081.pdf)

Abstract: This study examines the adsorption isotherms, kinetics and mechanisms of Pb2+ sorption onto waste cow bone powder (WCBP) surfaces. The concentrations of Pb2+ in the study range from 10 to 90 mg/L. Although the sorption data follow the Langmuir and Freundlich isotherm, a detailed examination reveals that surface sorption or complexation and co-precipitation are the most important mechanisms, along with possibly ion exchange and solid diffusion also contributing to the overall sorption process. The co-precipitation of Pb2+ with the calcium hydroxyapatite (Ca-HAP) is implied by significant changes in Ca2+ and PO4 (3-) concentrations during the metal sorption processes. The Pb2+ sorption onto the WCBP surface by metal complexation with surface functional groups such as a parts per thousand POH. The major metal surface species are likely to be a parts per thousand POPb+. The sorption isotherm results indicated that Pb2+ sorption onto the Langmuir and Freundlich constant q (max) and K (F) is 9.52 and 8.18 mg g(-1), respectively. Sorption kinetics results indicated that Pb2+ sorption onto WCBP was pseudo-second-order rate constants K (2) was 1.12 g mg-1 h-1. The main mechanism is adsorption or surface complexation (a parts per thousand POPb+: 61.6%), co-precipitation or ion exchange [Ca-3.93 Pb-1.07 (PO4)3 (OH): 21.4%] and other precipitation [Pb 50 mg L-1 and natural pH: 17%). Sorption isotherms showed that WCBP has a much higher Pb2+ removal rate in an aqueous solution; the greater capability of WCBP to remove aqueous Pb2+ indicates its potential as another promising way to remediate Pb2+-contaminated media.

Keywords: Adsorption, Adsorption Isotherm, Adsorption Isotherms, Aqueous Solution, Bone, Calcium, Cd2+, Changes, Complexation, Coprecipitation, Cow, Data, Desorption, Diffusion, Equilibrium, Examination, Freundlich, Freundlich Constant, Freundlich Isotherm, Functional Groups, Hydroxyapatite, Ion Exchange, Ion-Exchange, Isotherm, Isotherms, Kinetic, Kinetics, L1, Langmuir, Lead, Mechanism, Mechanisms, Media, Metal, Metal Sorption, Natural, Orthophosphates, Pb2+, pH, Potential, Precipitation, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Rate, Rate Constants, Removal, Soil, Solution, Sorption, Sorption Isotherm, Sorption Isotherms, Sorption Kinetics, Sorption Process, Species, Stability, Surface, Surface Complexation, Surface Functional Groups, Surfaces, Waste, Waste Cow Bone Powder, Water

# Title: Environmental Geology

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Environmental Sciences: Impact Factor 0.522, 93/126 (1999), Impact Factor 0.427, 98/127 (2000)

Geosciences, Interdisciplinary: Impact Factor

Water Resources: Impact Factor 0.427, 32/47 (2000)

Kooner, Z.S. (1993), Comparative study of adsorption behavior of copper, lead and zinc onto goethite in aqueous systems. *Environmental Geology*, **21**, 242-250.

Carrillo, A. and Drever, J.I. (1998), Adsorption of arsenic by natural aquifer material in the San Antonio El Triunfo mining area, Baja California, Mexico. *Environmental Geology*, **35** (4), 251-257.

Full Text: [E\Env Geo35, 251.pdf](E/Env%20Geo35,%20251.pdf)

Abstract: Several experiments of arsenic (As) adsorption by aquifer material of the San Antonio-El Triunfo (SA-ET) mining area were conducted to test the feasibility of this material acting as a natural control for As concentrations in groundwater. This aquifer material is mineralogically complex, composed of quartz, feldspar, calcite, chlorite, illite, and magnetite/hematite. The total iron content (Fe2O3) in the fine fraction is similar to 12%, whereas Fe2O3 in the coarse fraction is < 10 wt%. The experimental percent total As adsorbed vs. pH curves obtained match the topology of total As adsorbed onto iron oxi-hydroxides surface (arsenate + arsenite, high adsorption at low pH, low adsorption at high pH). A maximum of about 80% adsorbed in the experiments suggests the presence of arsenite in the experimental solutions. The experimental adsorption isotherm at pH 7 indicates saturation of surface sites at high solute concentrations. Surface titration of the aquifer material indicates a point of zero charge (PZC) for the adsorbent of about 8 to 8.5 (PZC for iron oxyhydroxides = 7.9-8.2). Comparison between experimental and modeled results (using the MICROQL and MINTEQA2 geochemical modeling and speciation computer programs) suggests that As is being adsorbed mostly by oxyhydroxides surfaces in the natural environment. Based on an estimated retardation factor (R), the travel time of the As plume from the SA-ET area to La Pat and Los Planes is about 700 to 5000 years.

Keywords: Arsenic Adsorption, Arsenic Contamination, Oxyhydroxides Surfaces, Fly-Ash, Sorption, Soils

Abu-El-Sha’r, W.Y., Gharaibeh, S.H. and Mahmoud, S. (2000), Removal of dyes from aqueous solutions using low-cost sorbents made of solid residues from olive-mill wastes (JEFT) and solid residues from refined Jordanian oil shale. *Environmental Geology*, **39** (10), 1090-1094.

Full Text: [E\Env Geo39, 1090.pdf](E/Env%20Geo39,%201090.pdf)

Abstract: The effectiveness of processed solid residue from olive-mill waste (JEFT) and solid residue of pyrolyzed oil shale in removing methylene blue a cationic dye and methyl orange as an anionic as dye from aqueous solutions has been investigated and compared with that of a commercial activated carbon, namely coconut-shell carbon. All three sorbents showed significant methylene-blue removal, but only the coconut granular-activated carbon showed notable methyl-orange removal. The oil-shale sorbent showed no removal and the olive carbon showed poor removal of methyl orange. The removal of both methylene blue and methyl orange increases with the lapse of time, and attains equilibrium in 100 min.

Keywords: Dyes, Low-Cost Sorbents, Adsorption, Methylene Blue, Methyl Organe, JEFT, Oil Shale Sorbent, Cocunut-Activated Carbon, Water

Al-Asheh, S. and Banat, F. (2001), Adsorption of copper and zinc by oil shale. *Environmental Geology*, **40** (6), 693-698.

Full Text: [E\Env Geo40, 693.pdf](E/Env%20Geo40,%20693.pdf)

Abstract: Oil shale is able to remove appreciable amounts of copper and zinc ions from aqueous solutions. It was noted that an increase in the adsorbent concentration with constant copper or zinc concentration resulted in greater metal removal from solution. An increase in the copper or zinc concentration with a constant sorbent concentration resulted in higher metal loading per unit weight of sorbent. For both metals, copper and zinc, equilibrium was attained after 24-h contact time. Increase in the initial pH or temperature of the metal solution resulted in an increase in the metal uptake per unit weight of the sorbent. Freundlich isotherm model was found to be applicable for the experimental data of Cu2+ and Zn2+ The results showed that oil shale could be used for the adsorption of the Cu2+ and Zn2+ with higher affinity toward Zn2+ ions. Addition of sodium salt to the metal solution influenced copper removal positively, but inhibited zinc removal.

Keywords: Adsorption, Copper, Oil Shale, Zinc, Ion-Exchange, Metal-Ions, Removal, Cadmium, Lead

? Saxena, V.K, Ahmed, S. (2001), Dissolution of fluoride in groundwater: A water-rock interaction study. *Environmental Geology*, **40** (9), 1084-1087

Full Text: [2001\Env Geo40, 1084.pdf](2001/Env%20Geo40,%201084.pdf)

Abstract: Fluoride-rich groundwater is well known in granite aquifers in India and the world. Although its presence is necessary, chances of health risk become high if the fluoride concentration is more than the permissible limit of 1.5 mg/l (World Health Organization, WHO) in drinking water. Fluoride mainly occurs in groundwater as a natural constituent. Results of a laboratory study on water-rock interaction at normal temperature, pressure and different chemical conditions indicate that the specific conductivity, pH, Ca and HCO3 are important chemical parameters for the dissolution of fluoride to groundwater from fluoride-rich minerals (e.g., fluorite). Experimental results indicate that an alkaline medium (pH=7.6 to 8.6), high HCO3 concentration (ranging from 350-450 mg/l), and moderate specific conductivity (ranging from 750-1,750 μS/cm) are favourable for fluoride dissolution. No significant correlation existed between fluoride and CaHCO3.

Keywords: fluoride, water-rock interaction, granite rocks, weathering, dissolution

Namasivayam, C., Yamuna, R.T. and Arasi, D.J.S.E. (2001), Removal of acid violet from wastewater by adsorption on waste red mud. *Environmental Geology*, **41** (3-4), 269-273.

Full Text: [E\Env Geo41, 269.pdf](E/Env%20Geo41,%20269.pdf)

Abstract: Waste red mud obtained during the processing of bauxite ore has been used for the adsorption of acid violet at different initial dye concentrations (10-40 mg/L), agitation time, adsorbent dosages (0.05-1.15 g/50 mL) and pH (2-11). Adsorption obeyed both Langmuir and Freundlich isotherms. Quantitative removal of dye was observed at pH 4.1. Desorption studies show that the adsorption is mainly due to ion-exchange.

Keywords: Red Mud, Adsorption, Isotherms, Dyes, Aqueous-Solutions, Dye Adsorption, Basic-Dyes, Equilibrium, Adsorbents, Silica, Nickel, Color, Water

Al-Asheh, S., Banat, F. and Masad, A. (2003), Physical and chemical activation of pyrolyzed oil shale residue for the adsorption of phenol from aqueous solutions. *Environmental Geology*, **44** (3), 333-342.

Full Text: [E\Env Geo44, 333.pdf](E/Env%20Geo44,%20333.pdf)

Abstract: Batch kinetics and isotherm studies were carried out to evaluate the sorption of phenol by pyrolyzed and activated Jordanian oil-shale. The effects of contact time, initial sorbate concentration, sorbent concentration, temperature, pH and inorganic salts (NaCl and KCl), on the adsorption process by different sorbents were considered. Chemically activated oil shale, pretreated with ZnCl2, gave the highest uptake of phenol. The isotherm experimental data fit well to Freundlich and Redlich-Paterson models and to a less extent to the Langmuir model. The increase in the initial sorbate concentration resulted in an increase in the uptake. Three kinetics models, namely the Morris-Weber model, the Lagergren model, and the pseudo-second-order model (PSOM), were applied to represent the experimental results for pyrolyzed and ZnCl2-oil shale sorbents. Pyrolyzed oil shale was prepared using a fluidized bed reactor at 520 °C in the presence of nitrogen. Physical activation was carried out by treating the resulted pyrolyzed oil shale with CO2 at 830 °C, while chemical activation of oil shale was carried out using KOH and ZnCl2 as impregnating agents.

Keywords: Oil shale, Physical activation, Chemical activation, Phenol, Jordan

? Veeresh, H., Tripathy, S., Chaudhuri, D., Hart, B.R. and Powell, M.A. (2003), Competitive adsorption behavior of selected heavy metals in three soil types of India amended with fly ash and sewage sludge. *Environmental Geology*, **44** (3), 363-370.

Full Text: [2003\Env Geo44, 363.pdf](2003/Env%20Geo44,%20363.pdf)

Abstract: Laboratory batch experiments were carried out to study the competitive sorption behavior of metals in three types of Indian soils, differing in their physicochemical properties: acid laterite (SL1), red alfisol (SL2) and black vertisol (SL3) treated with different proportions of fly ash and sewage sludge mixture. Representative samples were equilibrated with 10 to 200 muM L-1 concentrations of metals simultaneously containing Cd, Cu, Ni, Pb and Zn in 5 mM of Ca(NO3)2 solution. In most of the cases the affinity sequence of metals was Pb>Cu>Zn>Ni>Cd based on their amount of sorption, which varied little with either metal equilibrating concentrations or the soil/mixture type. The observed metal affinity sequences in different soils amended with mixtures were compared to the predicted affinity sequences based on metal properties and a good match was found with those predicted by metal hydrolysis constants. This indicated that formation and subsequent sorption of metal hydrolysis products on soil surface is the predominant mechanism for sorption. In all the cases, Pb and Cu showed higher affinity followed by Zn, Ni or Cd. The increase in the metal additions further enhanced the competition among metals for exchange sites. Adsorption isotherms showed that metal sorption was linearly related to its concentration in the equilibrium solution. The distribution coefficients (K-D) computed from the slopes of linear regression for different metals were higher in SL3 than in both SL2 and SL1. All the mixture amended soils produced higher K-D values than their respective controls. Selectivity between metals resulted in the following affinities based on their K-D values-Pb>Cu>Zn>Ni or Cd-which was in line with the value of the hydrolysis constant of the metals under study.

Keywords: Adsorption, Affinity Sequence, Alfisol, Bases, Cadmium, Cd, Chemical-Properties, Coal Ash, Copper, Distribution Coefficient, Equilibrium, Heavy Metal, India, Isotherms, Laterite, Organic-Matter, Sewage Sludge, Soft Acids, Soil, Sorption, Trace-Metals, Zinc

Zuhairi, W.Y.W. (2003), Sorption capacity on lead, copper and zinc by clay soils from South Wales, United Kingdom. *Environmental Geology*, **45** (2), 236-242.

Full Text: [E\Env Geo45, 236.pdf](E/Env%20Geo45,%20236.pdf)

Abstract: The sorption capacity of five clay soils from South Wales in the United Kingdom was investigated using two main tests, physico-chemical and batch equilibrium (BET). The physico-chemical property results show that soil weathered mudrocks (MR1), glacial till (GTI), and estuarine alluviums (NEA4, PEA3 and CEA3) are capable of being used as landfill liners and are chosen for further sorption tests. The batch tests (i.e. sorption tests) on soil suspension produce adsorption-pH curves, showing increasing adsorption at higher pH levels. The sorption data are also presented using adsorption isotherm curves and are best fitted using the Langmuir adsorption equation that yields the maximum adsorption capacity of the soils. The sorption capacity of soils are ranked as estuarine alluvium soils > glacial till > weathered mudrocks. Estuarine alluvium soils show a good buffering capacity and high sorption capability compared to glacial till and weathered mudrocks. The study also discovers that the maximum sorption capacities are highly influenced by the chemical properties of the soils.

Keywords: Sorption, Physico-Chemical, Batch Test, Landfill, United Kingdom

Özacar, M. and Şengil, İ.A. (2004), Equilibrium data and process design for adsorption of disperse dyes onto Alunite. *Environmental Geology*, **45** (6), 762-768.

Full Text: [E\Env Geo45, 762.pdf](E/Env%20Geo45,%20762.pdf)

Abstract: Adsorption of disperse dyes from aqueous solutions onto calcined alunite has been investigated to assess the possibility of using alunite for removing disperse dyes from aqueous solutions. The effects of particle size, adsorbent mass, initial pH and temperature of the dye solution on the adsorption capacities have been evaluated. Acidic pH was favorable for the adsorption of all dyes: Disperse Blue 56 (DB56), Disperse Red 74 (DR74) and Disperse Yellow 119 (DY119). The experimental data were correlated reasonably well by the Langmuir isotherm and the isotherm parameters (K-L and a(L)) have been calculated. The adsorption capacities were found to be 498, 525 and 500 mg of dye per g of calcined alunite for DB56, DR74 and DY119, respectively. The single-stage batch adsorber design of the adsorption of disperse dyes onto alunite has been studied based on the Langmuir isotherm equation.

Keywords: Disperse Dye, Alunite, Isotherm, Adsorption Capacity, Batch Adsorber Design, Activated-Sludge Biomass, Aqueous-Solutions, Calcined Alunite, Basic-Dyes, Bagasse Pith, Contact Time, Waste-Water, Removal, Adsorbents, Phosphate

Al-Asheh, S., Banat, F. and Masad, A. (2004), Kinetics and equilibrium sorption studies of 4-nitrophenol on pyrolyzed and activated oil shale residue. *Environmental Geology*, **45** (8), 1109-1117.

Full Text: [E\Env Geo45, 1109.pdf](E/Env%20Geo45,%201109.pdf)

Abstract: Sorption of the organic pollutant 4-nitrophenol (4-NP) by pyrolyzed and activated Jordanian oil-shale was studied. Pyrolyzed oil shale was prepared using a fluidized bed reactor at 520 degreesC in the presence of nitrogen. Physical activation was carried out by treating the pyrolyzed oil shale with CO2 at 830 degreesC, while chemical activation was achieved by using KOH and ZnCl2 as impregnating agents. Batch kinetics and isotherm studies were conducted to evaluate the sorption process. Effects of contact time, initial sorbate concentration, sorbent concentration, temperature, pH and inorganic salts (NaCl and KCl) on the sorption process by the different sorbents were considered. Chemically activated oil shale, pretreated with ZnCl2, gave the highest uptake of 4-NP. The isotherm experimental data fit reasonably well to Langmuir, Freundlich and Redlich-Paterson models. Three kinetic models, namely the Morris-Weber, Lagergren, and Pseudo-Second-Order model (PSOM), were applied to represent the experimental results for both pyrolyzed and ZnCl2-oil shale sorbents.

Keywords: Oil Shale, Physical Activation, Chemical Activation, 4-Nitrophenol, Jordan, P-Nitrophenol, Aqueous Systems, Adsorption, Phenol, Removal, Carbon, Ash

? Al-Futaisi, A., Jamrah, A., Al-Rawas, A. and Al-Hanai, S. (2007), Adsorption capacity and mineralogical and physico-chemical characteristics of Shuwaymiyah palygorskite (Oman). *Environmental Geology*, **51** (8), 1317-1327.

Full Text: [2007\Env Geo51, 1317.pdf](2007/Env%20Geo51,%201317.pdf)

Abstract: In this paper, Shuwaymiyah palygorskite in the Sultanate of Oman has been characterized mineralogically by X-ray diffraction (XRD) and electron microscopy, chemically by oxide compositions, structural formulae, and cation exchange capacity (CEC), and physically by specific surface area and adsorption isotherms. Batch adsorption studies were performed to evaluate the adsorption performance of methylene blue (MB) basic dye on the local clay mineral. The quantitative XRD analysis indicates that the purity of some selected samples of palygorskite clay is very high (about 70% of the clay minerals are palygorskite and 30% kaolinite). The scanning electron microscopy (SEM) and transmission electron microscopy (TEM) images clearly support this conclusion. The adsorption equilibrium revealed that Shuwaymiyah palygorskite clay can uptake up to 51 mg of MB per 1 g mass of clay. MB adsorption is best fitted by Langmuir isotherm, and a pseudo-second-order kinetic model can be efficiently used to predict the kinetic of adsorption of MB by the palygorskite. The results obtained from these laboratory-scale adsorption tests indicate the promising adsorption capability of the Omani palygorskite.

Keywords: Adsorption, Palygorskite, Methylene Blue, Physio-Chemical Characterization, Attapulgite Clay, Metal-Ions, Sepiolite, Dyes

# Title: Environmental Geology and Water Sciences

Full Journal Title: Environmental Geology and Water Sciences

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

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Language:

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Subject Categories:

: Impact Factor

Roddy, M. and Tomlinson, M. (1989), Peat deposit water quality in lake Istokpoga, Florida, USA. *Environmental Geology and Water Sciences*, **13**, 45-50.

Fazeli, M.S., Sathyanarayan, S., Satish, P.N. and Muthanna, L. (1991), Effect of paper mill effluents on accumulation of heavy metals in coconut trees near Nanjangud, Mysore District, Karnataka, India. *Environmental Geology and Water Sciences*, **17**, 47-50.

Abstract: Physicochemical characteristics of wasterwater from one of the paper mills nearNanjangud and the differential accumulation of heavy metals in parts of coconuttrees growing in the area irrigated directly by the wastewaters of a paper mill wereinvestigated. The total dissolved and suspended solids of wastewater were 1, 136.9mg/l and 2, 185.4 mg/l, respectively. Biological oxygen demand (BOD) expands and COD is beyond the tolerance limit proposed by Indian standards. Theconcentrations of heavy metals like Cu, Pb, Zn, Ni, Co, and Cd in coconut water, root, and leaf are higher than the limits suggested by World Health Organization.Survival of coconut trees irrigated by polluted waters indicates tolerance to toxicheavy metals. Since coconut forms part of human food chain, accumulation of toxicheavy metals may lead to organic disorders.

# Title: Environmental Health

Full Journal Title: Environmental Health

ISO Abbreviated Title:

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ISSN:

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Journal Country/Territory:

Language:

Publisher:

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Subject Categories:

: Impact Factor

? Regel, S.J. and Achermann, P. (2011), Cognitive performance measures in bioelectromagnetic research: Critical evaluation and recommendations. *Environmental Health*, **10**, Article Number: 10.

Full Text: [2011\Env Hea10, 10.pdf](2011/Env%20Hea10,%2010.pdf)

Abstract: Background: The steady increase of mobile phone usage has led to a rising concern about possible adverse health effects of radio frequency electromagnetic field (RF EMF) exposure at intensities even below the existing safety limits. Accumulating evidence suggests that pulse-modulated RF EMF may alter brain physiology. Yet, whereas effects on the human electroencephalogram in waking and sleep have repeatedly been shown in recent years, results on cognitive performance are inconsistent. Methods: This review compares 41 provocation studies regarding the effects of RF EMF exposure similar to mobile telephones on cognitive performance measures in humans. The studies were identified via systematic searches of the databases Pub Med and ISI Web of Science and were published in peer-reviewed journals between 1998 and the end of 2009. Results: Based on a critical discussion within the scope of methodological standards it is concluded that state-of-the-art-methods in bio-electromagnetic research on RF EMF effects and cognition have neither been specified nor fully implemented over the last 10-11 years. The lack of a validated tool, which reliably assesses changes in cognitive performance caused by RF EMF exposure, may contribute to the current inconsistencies in outcomes. The high variety of findings may also be due to methodological issues such as differences in sample size and the composition of study groups, experimental design, exposure setup as well as the exposure conditions, and emphasizes the need for a standardized protocol in bioelectromagnetic research. Conclusions: At present, no underlying biological mechanism has been identified which mediates the effects on brain functioning as observed in electroencephalographic (EEG) studies. A future aim must be to identify this mechanism as well as a reliable exposure protocol in order to gain more insights into possible behavioral and related health consequences of high-frequency EMF exposure.

Keywords: Affects Human Sleep, Auditory Memory Task, Brain, Cellular Phones, Cerebral-Blood-Flow, Cognition, Critical, Databases, Evaluation, Event-Related Potentials, Frequency, Human, Human Attention, Humans, Inconsistencies, ISI, Journals, Mechanism, Methods, Mobile Phone Exposure, Outcomes, Performance, Protocol, Pub Med, Radiofrequency Electromagnetic-Fields, Research, Review, Safety, Science, Slow Brain Potentials, Standards, Systematic, Web of Science, Working-Memory

? Grandjean, P., Eriksen, M.L., Ellegaard, O. and Wallin, J.A. (2011), The Matthew effect in environmental science publication: A bibliometric analysis of chemical substances in journal articles. *Environmental Health*, **10**, Article Number: 96.

Full Text: [2011\Env Hea10, 96.pdf](2011/Env%20Hea10,%2096.pdf)

Abstract: Background: While environmental research addresses scientific questions of possible societal relevance, it is unclear to what degree research focuses on environmental chemicals in need of documentation for risk assessment purposes. Methods: In a bibliometric analysis, we used SciFinder to extract Chemical Abstract Service (CAS) numbers for chemicals addressed by publications in the 78 major environmental science journals during 2000-2009. The Web of Science was used to conduct title searches to determine long-term trends for prominent substances and substances considered in need of research attention. Results: The 119,636 journal articles found had 760,056 CAS number links during 2000-2009. The top-20 environmental chemicals consisted of metals, (chlorinated) biphenyls, polyaromatic hydrocarbons, benzene, and ethanol and contributed 12% toward the total number of links-Each of the top-20 substances was covered by 2,000-10,000 articles during the decade. The numbers for the 10-year period were similar to the total numbers of pre-2000 articles on the same chemicals. However, substances considered a high priority from a regulatory viewpoint, due to lack of documentation, showed very low publication rates. The persistence in the scientific literature of the top-20 chemicals was only weakly related to their publication in journals with a high impact factor, but some substances achieved high citation rates. Conclusions: The persistence of some environmental chemicals in the scientific literature may be due to a ‘Matthew’ principle of maintaining prominence for the very reason of having been well researched. Such bias detracts from the societal needs for documentation on less well known environmental hazards, and it may also impact negatively on the potentials for innovation and discovery in research.

Keywords: Abstract, Analysis, Assessment, Attention, Bias, Bibliometric, Bibliometric Analysis, Chemicals, Citation, Documentation, Environmental, Environmental Research, Environmental Science, Ethanol, Health, Impact, Impact Factor, Innovation, Journal, Journals, Literature, Low, Matthew Effect, Metals, Methods, Persistence, Priority, Publication, Publications, Research, Risk, Risk Assessment, Science, Scientific Literature, Trends, Web of Science

# Title: Environmental Health Perspectives

Full Journal Title: [Environmental Health Perspectives](http://www.pubmedcentral.nih.gov/tocrender.fcgi?action=archive&journal=253); [Environmental Health Perspectives](http://www.jstor.org/browse/00916765/.91-.100?frame=noframe&userID=8c7fb148@isu.edu.tw/01c0a83474005025153&dpi=3&config=jstor)

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Environmental Sciences: Impact Factor 2.469, 5/126 (1999), Impact Factor 3.033, 4/127 (2000); Impact Factor 5.342, 1/140 (2005)

Public, Environmental & Occupational Health: Impact Factor 2.469, 9/85 (1999), Impact Factor 3.033, 6/89 (2000); Impact Factor 5.342, 1/99 (2005)

? Fowler, B.A., Fay, R.C., Walter, R.L., Willis, R.D. and Gutknecht, W.F. (1975), Levels of toxic metals in marine organisms collected from Southern California coastal waters. *Environmental Health Perspectives*, **12**, 71-76.

Full Text: [1960-80\Env Hea Per12, 71.pdf](1960-80/Env%20Hea%20Per12,%2071.pdf)

Abstract: Emission of toxic trace metals into southern California coastal waters has resulted in the extensive accumulation of the elements within marine sediments. The current study was undertaken to evaluate concentrations of trace metals in bottom-dwelling marine fauna collected from two sampling areas. Analyses carried out on muscle samples of the dover sole (Microstomus pacificus) and the crab (Cancer anthonyi) by proton-induced x-ray emission analysis showed considerable concentrations of arsenic and selenium. Samples of gonads, digestive gland, and muscle from the crab Mursia gaudichaudii analyzed by atomic absorption spectroscopy showed elemental concentrations in muscle similar to the crab Cancer anthonyi and much higher metal levels in gonad and digestive gland. These findings suggest the need for further studies concerning the relationship between emission of metals into the marine environment and their abundance in marine fauna.

? Krasovskii, G.N. (1976), Extrapolation of experimental data from animals to man. *Environmental Health Perspectives*, **13**, 51-58.

Full Text: [1960-80\Env Hea Per13, 51.pdf](1960-80/Env%20Hea%20Per13,%2051.pdf)

Abstract: Conditions for extrapolating toxicologic data from animals to man were studied. In the search for general regularities associated with the comparative sensitivity of humans and various species of animals to toxins, it was shown that the toxicity parameters of compounds and the biological constants of mammals correlate with body weight. This relationship is well described by a rectilinear regression equation which holds for more than 100 of the most diverse mammalian biological constants. The toxicity parameters for 80% of the substances also are subordinated to this regularity. This made it possible to develop a computational method for extrapolating toxicologic data from animals to the “average” man. In order to increase the reliability of extrapolation, it is necessary to take into consideration the limits of variability of sensitivity of various population contingents to the effect of chemical compounds, estimate the accuracy of establishing the threshold and no-effect doses of substances under chronic experiment conditions with animals and determine the maximally possible error associated with extrapolating experimental data to the “average” man. In this respect, it is advisable to use a coefficient of reserve whose value should not be less than 10 in order to ensure safe conditions for the transfer of the results of toxicologic studies to public health practice.

? Hesse, J.L. and Powers, R.A. (1978), Polybrominated biphenyl (PBB) contamination of the Pine River, Gratiot, and Midland Counties, Michigan. *Environmental Health Perspectives*, **23**, 19-25.

Full Text: [1960-80\Env Hea Per23, 19.pdf](1960-80/Env%20Hea%20Per23,%2019.pdf)

Abstract: Michigan Chemical Corporation, St. Louis, Michigan manufactured PBB from 1970 until November 20, 1974. Studies in 1974 showed significant quantities of PBB in effluent discharged from the facility and in water, fish, ducks, and sediments from the Pine River. Fish uptake rates and bioconcentration factors were estimated. Followup surveys over the three year period since the termination of PBB production indicate a decline in PBB loadings to the river but no significant corresponding decline of PBB levels in sediments, fish and duck tissue. A Michigan Department of Public Health warning against consumption of Pine River fish from St. Louis downstream to its confluence with Chippewa River remains in effect.

? Odum, W.E. and Drifmeyer, J.E. (1978), Sorption of pollutants by plant detritus - Review. *Environmental Health Perspectives*, **27** (DEC), 133-137

Full Text: [1960-80\Env Hea Per27, 133.pdf](1960-80/Env%20Hea%20Per27,%20133.pdf)

Abstract: Detritus particles derived from the decomposition of vascular plants appear to have a high sorptive capability for a wide range of pollutants. Evidence is presented and reviewed which shows detrital concentration of heavy metals, radionuclides, and organochlorine insecticides. A study of a roadside marsh indicates that lead originating from automobile exhausts may reach concentrations as high as 1415 ppm on marshgrass detritus. We suggest that these elevated concentrations may, in turn, be passed on to detritivores which ingest the contaminated particles and experience desorption and assimilation of the poilutant within the digestive tract. Finally, potential mechanisms are listed which might explain detrital sorption; these include: microbial uptake (adsorption and metabolic absorption), association with detrital and microbial lipids, electrostatic adsorption in response to charges on the detritus particles, and formation of complexes and chelates at active sites on the organic molecules of the decomposing detritus. Keywords: Pollutants, Sorption

? Levander, O.A. (1979), Lead toxicity and nutritional deficiencies. *Environmental Health Perspectives*, **29**, 115-125.

Full Text: [1960-80\Env Hea Per29, 115.pdf](1960-80/Env%20Hea%20Per29,%20115.pdf)

Abstract: Under appropriate conditions, deficiencies of certain minerals and vitamins as well as high intakes of dietary fat increase the toxicity of a given dose of lead in experimental animals. The severity of lead poisoning can also be increased by the consumption of either deficient or excessive levels of protein. Mineral deficiencies appear to have some of the most profound effects on lead toxicity, since the consequences of plumbism can be exaggerated by feeding diets low in calcium, phosphorus, iron, zinc, and in some cases, copper. Evidence for an antagonism between lead and nutritional levels of selenium is inconclusive. Vitamin E deficiency and lead poisoning interact to produce an anemia in rats that is more severe than that caused by either treatment alone. Lead apparently exerts a pro-oxidant stress on the red cell, thereby causing its accelerated destruction. One of the biochemical mechanisms of lead poisoning may be the disruption of normal membrane architecture, thereby leading to peroxidative damage. Epidemiological surveys have suggested a negative correlation between the poor nutritional status of children with regard to calcium and the concentration of lead in blood. Other examples of potential interactions of mineral status and lead poisoning in humans include the hypothesized hazards of soft water to public health in areas with lead plumbing and the possible role of mineral deficiencies in the etiology of pica. Experimental studies have shown that in some situations combined nutritional deficiencies can have an additive effect in potentiating lead toxicity.

? Furst, A. (1981), Bioassay of metals for carcinogenesis: Whole animals. *Environmental Health Perspectives*, **40**, 83-91.

Full Text: [1981\Env Hea Per40, 83.pdf](1981/Env%20Hea%20Per40,%2083.pdf)

Abstract: Metals have been evaluated as potential carcinogens by administering pure elements or compounds by a large variety of routes. These include mixing the agent in the food, dissolving the test compound in the drinking water, or administering the material by gavage. The respiratory tract routes tested include inhalation, intratracheal instillation, the direct injection of particulates into the pleural cavity, or the implantation of hooks by surgical intervention. The parenteral routes used were intravenous injection, intraperitoneal injection, subcutaneous implantation, as well as intrafemoral and intramuscular injection. This latter route is the most commonly used. There are major objections to the subcutaneous implantations route, and data generated from these experiments are difficult to interpret for the foreign body reaction may give rise also to fibrosarcomas. This then is a nonspecific reaction. Exotic routes tested include intrarenal, intratesticular, and intracranial injections. The endpoints of the carcinogenic reactions are, in the main, sarcomas of certain types with fibrosarcomas predominating. Rhabdomyosarcomas are the next most frequent cancer found, and squamous cell carcinoma may account for less than 2% of the cancers reported. Much more research is necessary to clarify the nature of metal carcinogenesis. Dose-response information is almost nonexistent, the divided dose problem has not been studied adequately, and very little information is available on interspecies reactions. More work is needed to help interpret the mechanism of action.

? Akin, E.W., Hoff, J.C. and Lippy, E.C. (1982), Waterborne outbreak control: Which disinfectant? *Environmental Health Perspectives*, **46**, 7-12.

Full Text: [1982\Env Hea Per46, 7.pdf](1982/Env%20Hea%20Per46,%207.pdf)

Abstract: Drinking water disinfection was shown to be an important public health measure around the turn of the century. In the United States, it was perhaps the single most important factor in controlling typhoid fever, a waterborne disease that was rampant throughout the world during the last century. It may also be assumed that disinfection was important in limiting the number of cases of other diseases known to be capable of waterborne transmission, i.e., cholera, amebiasis, shigellosis, salmonellosis, and hepatitis A. Even though modern treatment has eliminated water as a major vehicle of infectious disease transmission, outbreaks still occur. In fact, the annual number has been increasing since 1966. Interruption in chlorination or failure to achieve adequate levels of chlorine residual is the most often identified deficiency of the involved water supplies. This finding indicates that waterborne microbial pathogens remain as a potential health threat and underscores the importance of disinfection. From the outset, chlorination has been the drinking water disinfectant of choice in the country. Numerous studies have demonstrated its ability to inactivate bacterial, viral, and protozoal pathogens when applied under proper conditions. However, the finding that chlorinated organics that are potentially carcinogenic are formed has prompted an evaluation of alternative disinfectants. The viable alternatives to chlorine currently under consideration for widespread use are ozone, chlorine dioxide, and chloramines. In terms of biocidal efficiency, ozone is the most potent of the three. Chlorine dioxide is about the equivalent of free chlorine in the hypochlorous acid form but much more efficient than the hypochlorite form of free chlorine. The chloramines are weaker biocides than hypochlorite. Although this general order of ranking of efficiency holds for diverse types of microorganisms, quantitative comparisons vary with different microorganisms and experimental conditions.

? Calabrese, E.J. (1983), Role of epidemiologic studies in deriving drinking water standards for metals. *Environmental Health Perspectives*, **52**, 99-106.

Full Text: [1983\Env Hea Per52, 99.pdf](1983/Env%20Hea%20Per52,%2099.pdf)

Abstract: Epidemiological investigations are shown to have contributed in a significant way to our understanding of the potential adverse health effects of drinking water with elevated levels of several metals. Particular emphasis is given to an assessment of the epidemiological investigations concerned with characterizing the health effects of exposure to elevated levels of arsenic and sodium in drinking water.

? Toft, P. and Meek, M.E. (1983), Asbestos in drinking water: A Canadian view. *Environmental Health Perspectives*, **53**, 177-180.

Full Text: [1983\Env Hea Per53, 177.pdf](1983/Env%20Hea%20Per53,%20177.pdf)

Abstract: For several years now, public health professionals have been faced with evaluating the potential hazards associated with the ingestion of asbestos in food and drinking water. In Canada, this is a subject of particular concern, because of the widespread occurrence of chrysotile asbestos in drinking water supplies. The results of available Canadian monitoring and epidemiologic studies of asbestos in drinking water are reviewed and discussed in light of other published work. It is concluded that the risk to health associated with the ingestion of asbestos, at the levels found in municipal drinking water supplies, is so small that it cannot be detected by currently available epidemiologic techniques.

? Anderson, H.A. (1985), Evolution of environmental epidemiologic risk assessment. *Environmental Health Perspectives*, **62**, 389-392.

Full Text: [1985\Env Hea Per62, 389.pdf](1985/Env%20Hea%20Per62,%20389.pdf)

Abstract: Epidemiology has historically played an important role in the recognition of causes for diseases affecting the health of the public. Initially, epidemiology was concerned with infectious diseases. Later it became involved in metabolic and dietary deficiency diseases. Most recently, epidemiology has addressed the question of the public health effects of chemicals from production facilities, accidental spills, and chemical waste disposal sites. Concurrent improvements in the sensitivity of chemical analyses have enabled the identification of chemicals arising from waste disposal sites in the soil, air, drinking water, and food supplies of neighboring residential areas, albeit usually at very low concentrations. This knowledge has created great concerns among the affected populations and their public health agencies. The responsibility for interpreting the potential severity of the health effects of these environmental contaminants has fallen to those scientists experienced in epidemiology. This has led to a subdiscipline, reactive epidemiology, which describes investigations focused on specific events, usually under emotion-laden circumstances, rather than scientific merit. The reactive epidemiologist is rigidly constrained as to the size, timing, and location of the study. There is a strong requirement for public communication skills. New data bases are needed including “sentinel” diseases that are linked to exposure to chemicals, records of land use, and residency data for the population at risk.

? Buffler, P.A., Crane, M. and Key, M.M. (1985), Possibilities of detecting health effects by studies of populations exposed to chemicals from waste disposal sites. *Environmental Health Perspectives*, **62**, 423-456.

Full Text: [1985\Env Hea Per62, 423.pdf](1985/Env%20Hea%20Per62,%20423.pdf)

Abstract: Factors affecting the design of an epidemiologic study assessing possible health effects from chemical waste disposal sites are reviewed. Such epidemiologic studies will most likely be prompted either by a known release of chemicals into the environment around the site, or by an unusual disease cluster in a population near the site. In the latter situation, a method for evaluating the health effects is needed, and one possible approach is discussed. In the former situation, it may not be obvious what health outcomes are relevant. Reported associations between health effects and chemicals in humans were reviewed. Studies from the occupational and environmental literature were classified by chemical and target organ affected and presented in tabular form. No attempt was made to critically evaluate the quality of evidence for each health effect, although bibliographic documentation was provided where possible. Episodes of chemical contamination of food, drinking water and other media were also reviewed and presented in a separate table. The organ sites likely to be affected by toxic chemicals from waste disposal sites depend heavily on the route of exposure and the dose that is received. Ingestion is the most frequently reported route of exposure in episodes of environmental contamination. These have affected the hepatic, renal, hematopoietic, reproductive, and central nervous systems. The type and severity of effects were dose-dependent. Direct skin contact is important in the occupational environment where dermal and central nervous system effects have been reported but seems less likely as a route of exposure for populations around waste disposal sites. Inhalation, unless at relative high concentrations or as a result of fire, is unlikely to be important, although hematopoietic, reproductive, and central nervous system effects have been reported in occupational studies.

? Sharpe, W.E. and De Walle, D.R. (1985), Potential health implications for acid precipitation, corrosion, and metals contamination of drinking water. *Environmental Health Perspectives*, **63**, 71-78.

Full Text: [1985\Env Hea Per63, 71.pdf](1985/Env%20Hea%20Per63,%2071.pdf)

Abstract: Potential health effects of drinking water quality changes caused by acid precipitation are presented. Several different types of water supply are discussed and their roles in modifying acid rain impacts on drinking water are explained. Sources of metals contamination in surface water supplies are enumerated. The authors present some results from their research into acid rain impacts on roof-catchment cisterns, small surface water supplies, and lead mobilization in acid soils. A good correlation was obtained between cistern water corrosivity as measured by the Ryznar Index (RI) values and standing tapwater copper concentrations. However, lead concentrations in tapwater did not correlate well with cistern water RI. A modified linear regression model that accounted for Ryznar Index change during storage in vinyl-lined cisterns was used to predict the Ryznar Index value at a copper concentration of 1000 micrograms/L. The predicted RI was greater than the RI of precipitation with a pH of 5.3, indicating that anthropogenically acidified precipitation may result in cistern tapwater copper concentrations in excess of the 1000 micrograms/L suggested drinking water limit. Good correlations between tapwater Ryznar Index and tapwater copper and lead concentrations were not obtained for the small surface water supply. Aluminum concentrations in reservoir water were similar to those in stream source water. Limited data were also presented that indicated lead was present in acid forest soil leachate and streams draining such soils in relatively small concentrations. Where appropriate, recommendations for future research are included with the discussions of research results.

? (1987), Report on cancer risks associated with the ingestion of asbestos. DHHS Committee to Coordinate Environmental and Related Programs. *Environmental Health Perspectives*, **72**, 253-265.

Full Text: [1987\Env Hea Per72, 253.pdf](1987/Env%20Hea%20Per72,%20253.pdf)

Abstract: This report is an assessment of all available literature that pertains to the potential risk of cancer associated with ingestion of asbestos. It was compiled by a working group to assist policy makers in the Department of Health and Human Services determine if adequate information was available for a definitive risk assessment on this potential problem and evaluate if the weight of evidence was sufficient to prioritize this issue for new policy recommendations. The work group considered the basis for concern over this problem, the body of toxicology experiments, the individual epidemiologic studies which have attempted to investigate this issue, and the articles that discuss components of risk assessment pertaining to the ingestion of asbestos. In the report, the work group concluded: that no direct, definitive risk assessment can be conducted at this time, that further epidemiologic investigations will be very costly and only possess sufficient statistical power to detect relatively large excesses in cancers related to asbestos ingestion, and that probably the most pertinent toxicologic experiments relate to resolving the differences in how inhaled asbestos, which is eventually swallowed, is biologically processed by humans, compared to how ingested asbestos is processed. The work group believes that the cancer risk associated with asbestos ingestion should not be perceived as one of the most pressing potential public health hazards facing the nation. However, the work group does not believe that information was sufficient to assess the level of cancer risk associated with the ingestion and therefore, this potential hazard should not be discounted, and ingestion exposure to asbestos should be eliminated whenever possible.

? Sedman, R.M. (1989), The development of applied action levels for soil contact: A scenario for the exposure of humans to soil in a residential setting. *Environmental Health Perspectives*, **79**, 291-313.

Full Text: [1989\Env Hea Per79, 291.pdf](1989/Env%20Hea%20Per79,%20291.pdf)

Abstract: The California Site Mitigation Decision Tree Manual, (1985), was developed by the California Department of Health Services to provide a detailed technical basis for managing uncontrolled hazardous waste sites. The Decision Tree describes a process that relies on criteria, Applied Action Levels (AALs) to evaluate and, if necessary, mitigate the impact of uncontrolled hazardous waste sites on the public health and the environment. AALs are developed for individual substances, species, and media of exposure. AALs have been routinely developed for the media of air and water, however, an approach for developing AALs for soil contact was lacking. Given that the air pathway for soil contact is addressed in AALs for air, two routes of exposure, ingestion and dermal contact, are addressed in developing AALs for soil contact. The approach assumes a lifetime of exposure to soil in a residential setting. Age-related changes in exposure are included in the scenario. Exposure to soil due to ingestion and dermal contact are quantitated independently and then integrated in the final exposure scenario. A mass balance approach using four elements is employed to quantitate soil ingestion for a young child. Changes in soil ingestion with age are based on age-related changes in blood lead concentration and mouthing behavior. Dermal exposure to soil was determined from studies that reported skin soil load and from estimates of exposed skin surface area. Age-related changes in the dermal exposure to soil are also based on changes with age of blood lead concentration and mouthing behavior. The estimates of exposure to soil due to ingestion and dermal contact are integrated, and an approach for developing AALs is advanced. AALs are derived by allocating the Maximum Exposure Level as described in the Decision Tree to the average daily exposure to soil. Toxicokinetic considerations for the two routes of exposure must be included in deriving AALs for the soil medium of exposure.

Mahaffey, K.R. (1990), Introduction: Advances in lead research: Implications for environmental health. *Environmental Health Perspectives*, **89**, 3.

Full Text: [1990\Env Hea Per89, 3.pdf](1990/Env%20Hea%20Per89,%203.pdf)

Bellinger, D., Leviton, A. and Sloman, J. (1990), Antecedents and correlates of improved cognitive performance in children exposed in Utero to low levels of lead. *Environmental Health Perspectives*, **89**, 5-11.

Full Text: [1990\Env Hea Per89, 5.pdf](1990/Env%20Hea%20Per89,%205.pdf)

Dietrich, K.N., Succop, P.A., Bornschein, R.L., Krafft, K.M., Berger, O., Hammond, P.B. and Buncher, C.R. (1990), Lead exposure and neurobehavioral development in later infancy. *Environmental Health Perspectives*, **89**, 13-19.

Full Text: [1990\Env Hea Per89, 13.pdf](1990/Env%20Hea%20Per89,%2013.pdf)

Lilienthal, H., Winneke, G. and Ewert, T. (1990), Effects of lead on neurophysiological and performance measures: Animal and human data. *Environmental Health Perspectives*, **89**, 21-25.

Full Text: [1990\Env Hea Per89, 21.pdf](1990/Env%20Hea%20Per89,%2021.pdf)

Freedman, R., Olson, L. and Hoffer, B.J. (1990), Toxic effects of lead on neuronal development and function. *Environmental Health Perspectives*, **89**, 27-33.

Full Text: [1990\Env Hea Per89, 27.pdf](1990/Env%20Hea%20Per89,%2027.pdf)

Abstract: The effects of lead on the development of the nervous system are of immediate concern to human health. While it is clear that lead can affect neuronal development at levels of exposure within the range found in the environment, the particular mechanism of the disruption is not readily ascertained. Lack of knowledge of the mechanism of lead-induced damage hampers its treatment and prevention. The goal of our research is to develop a model system in which the effects of lead on central nervous system development can be demonstrated. The complexity of the brain hampers such investigations because often it is not clear if apparent toxic effects represent changes secondary to somatic changes, such as endocrine or hematological defects, that could alter brain development, or even transneuronal effects caused by toxicity at a distal site that deprives a brain area of a synaptic input needed for its proper development. A related problem is the redundancy of compensatory systems in the brain. Such systems may disguise the severity of the initial toxic insult and themselves can cause functional disturbances.

To study neuronal development in a system that minimizes such difficulties, we have grafted discrete brain regions derived from rat fetuses into the anterior chamber of the eye of adult hosts. The brain pieces continue organotypic development in the eye, but are isolated from possible secondary changes due to alterations in the development of the endocrine and other somatic systems because the adult host has these systems already fully developed. Similarly, effects mediated by connecting brain areas are minimized since the transplant is isolated in the anterior chamber of the eye. Using this system, we have discovered that lead induces a hypernoradrenergic innervation of central nervous system tissue. The increased innervation is observed not only structurally, but also functionally. Since norepinephrine is an inhibitory neurotransmitter, this ingrowth may explain the profound slowing of discharge of cerebellar neurons recorded in grafts of lead-treated animals. Studies in other tissues suggest that increased axonal ingrowth may be a general problem of lead intoxication that encompasses many brain areas, as well as peripheral sympathetic systems. Syndromes such as hyperactivity might be the behavioral consequence of these alterations in neuronal development.

Bhattacharya, A., Shukla, R., Bornschin, R.L., Dietrich, K.N. and Keith, R. (1990), Lead effects on postural balance of children. *Environmental Health Perspectives*, **89**, 35-42.

Full Text: [1990\Env Hea Per89, 35.pdf](1990/Env%20Hea%20Per89,%2035.pdf)

Abstract: The postural sway responses of 63 children with a mean age of 5.74 years were quantified with a Force Platform technique. The average maximum (max) blood lead (PbB) of these children during the first 5 years of life was 20.7 ug/dL (range 9.2 to 32.5). The backward stepwise regression analysis for sway area response during the eyes-closed, no-foam test with all the covariates and confounders and the PbB parameters showed a significant relationship with peak or max PbB during the second year of life. These results are consistent with our previous study with a smaller group of children. The data have been analyzed to provide some insight into the role of various afferents for the maintenance of postural balance. The results suggests a hypothesis that if the max PbB had caused some level of impairment in the functional capacities or interconnectivity of the vestibular and/or proprioception systems at 2 years of age, then it is reasonable to assume that the redundancy in the postural afferent systems would naturally adapt to rely more on the remaining intact afferent system (in this case, vision).

Verity, M.A. (1990), Comparative observations on inorganic and organic lead neurotoxicity. *Environmental Health Perspectives*, **89**, 43-48.

Full Text: [1990\Env Hea Per89, 35.pdf](1990/Env%20Hea%20Per89,%2035.pdf)

Abstract: Environmental and occupational exposure to lead still generates concern, and recent studies have focused such concern on the role of body burden of lead during the fetal/neonatal period, especially in the genesis of disturbed central nervous system development. This discussion provides some comparative observations on the neurotoxicity of inorganic and organic lead species. The characteristic acute, predominantly cerebellar encephalopathy associated with neonatal high lead exposure contrasts to the subtle, axo-dendritic disorganization shown to be associated with low-level neonatal inorganic Pb2+ exposure. There is a preferential involvement of the hippocampus in both low-level inorganic Pb2+ and organolead exposure, and the clinical syndromes of irritability, hyperactivity, aggression, and seizures are common features of disturbed hippocampal function. Neurotransmitter system abnormalities have been described with inorganic Pb2+, but recent attention has focused on the abnormalities in glutamate, dopamnine, and/or y-aminoboutyric acid (GABA) uptake, efflux, and metabolism. Abnonnalities of GABA and glutamate metabolism are also found with the organolead species. While the pathogenesis is still unclear, the interactive role of Pb2+ on mitochondrial energy metabolism, Ca2+ uptake, intracellular CaF+ homeostasis, and neurotransmitter influx/efflux is considered. Consideration is given to low-dose inorganic Pb2+ and organolead effects on mitochondrial and/or plasmalemmel membranes inducing either Cl-/OH- antiport-linked depolarization, inhibition of intracellular ATP biosynthesis and transduction, and/or abnormalities induced due to the preferential affinity of Pb2+ for intracellular Ca2+-cytoplasmic proteins, e.g., calmodulin. Testable hypotheses are presented that may provide an understanding of the pathogenesis underlying dystrophic neuronal development under the influence of inorganic or organolead intoxication.

Silbergeld, E.K. (1990), Implications of new data on lead toxicity for managing and preventing exposure. *Environmental Health Perspectives*, **89**, 49-54.

Full Text: [1990\Env Hea Per89, 49.pdf](1990/Env%20Hea%20Per89,%2049.pdf)

Abstract: Recent advances in research on low-level lead poisoning point to the need to increase efforts to prevent exposure. Current biomedical consensus accepts that blood lead levels as low as 5 to 15 mcg/dL are risky to fetuses, young children, and adults. Lead at low dose is associated with increased blood pressure in adults, and chronic exposure has been associated in cohort studies with kidney disease and cancer. Data on lead toxicokinetics also points to the hazards of low-level, chronic exposure, since the lead that is accumulated over time in bone can be released at a relatively rapid rate during pregnancy and menopause. Sources that contribute to current lead exposure of the general population include unabated lead-based paint and contaminated soils, as well as lower level but pervasive sources in drinking water, food, and consumer products.

Thornton, D., Davies, D., Watt, M. and Quinn, M. (1990), Lead exposure in young children from dust and soil in the United Kingdom. *Environmental Health Perspectives*, **89**, 55-60.

Full Text: [1990\Env Hea Per89, 55.pdf](1990/Env%20Hea%20Per89,%2055.pdf)

Abstract: A survey of metals in United Kingdom dusts and soils has confirmed widespread lead contamination with a geometric mean value for lead in surface (0-5 cm) garden soils of 266 Mg/g and in housedusts of 561 yg/g (excluding old mining areas). A subsequent detailed survey of 97 householders in Birmingham with 2-yearold children showed dust lead loading in the home environment to be an important predictor of blood lead concentrations in young children, when both variables fell within the normal range for the U.K. The total estimated lead uptake by the young child was 36 pg/day of which 1 Ag was by inhalation and 35,ug by ingestion.

Landrigan, P.J. (1990), Current issues in the epidemiology and toxicology of occupational exposure to lead. *Environmental Health Perspectives*, **89**, 61-66.

Full Text: [1990\Env Hea Per89, 61.pdf](1990/Env%20Hea%20Per89,%2061.pdf)

Abstract: Occupational exposure to lead is widespread in the United States. Clinically evident lead poisoning as well as subclinical toxicity occur in populations with occupational lead exposure. The focus of current research on lead toxicity in industrial populations is in the definition of dose-response relationships, particularly at low levels of exposure. Major interest surrounds the development of biochemical and physiologic markers of subclinical toxicity. Need exists to better delineate the toxicity of lead on the peripheral and central nervous system, the kidneys, the cardiovascular system, and the reproductive organs using newly developed markers ‘lb obtain more accurate information on cumulative individual exposure to lead, future research on lead toxicity will increasingly use X-ray fluorescence analysis for determination of the lead content in bone.

Chisolm, Jr., J.J. (1990), Evaluation of the potential role of chelation therapy in treatment of low to moderate lead exposures. *Environmental Health Perspectives*, **89**, 67-74.

Full Text: [1990\Env Hea Per89, 67.pdf](1990/Env%20Hea%20Per89,%2067.pdf)

Abstract: In the overall long-term management of lead poisoning, chelation therapy can have short-term benefits; however, these benefits must be accompanied by drastic reduction in environmental exposure to lead if therapy is to have any long-term benefit. This discussion is limited to calcium disodium ethylenediaminetetraacetate (CaNa2EDTTA), the chelating agent that has been the mainstay of treatment of lead poisoning for the past 38 years, and to meso-2,3-dimercaptosuccinic acid (DMSA), a new and promising oral chelating agent, which is an orphan drug and is currently classified as an investigational new drug by the U.S. Food and Drug Administration. With both drugs, multiple courses of treatment will be needed if any substantial reduction in body lead burden is to be achieved. A major limitation of CaNa2EDTA is the enormous diuresis of zinc that it produces. DMSA produces a comparable diuresis of lead, a greater decrease in blood lead, and has negligible influence on the urinary losses of zinc, copper, iron, and calcium. Limited experience to date in man has revealed no significant adverse side effects of DMSA. In animals, DMSA will promptly reduce the concentration of lead in brain and kidney, in particular. By contrast, similar 5-day courses of CaNa2EDTA do not produce any net reduction in brain lead. This is important, as the brain is the critical organ of the adverse effects of lead in children. If the efficacy ofDMSA is to be comprehensively evaluated ethically in children, new and more sensitive neurochemical, electrophysiologic, or other markers must be developed.

Mahaffey, K.R. (1990), Environmental lead toxicity: Nutrition as a component of intervention. *Environmental Health Perspectives*, **89**, 75-78.

Full Text: [1990\Env Hea Per89, 75.pdf](1990/Env%20Hea%20Per89,%2075.pdf)

Abstract: The influence of nutritional status on susceptibility to the toxicity of lead is discussed. Emphasis is given to dietary factors of substantial clinical importance. Subtle changes in susceptibility are difficult to evaluate under conditions of overwhelning lead exposure. It is clear that subtle effects of lead exposure on neurobehavioral and cognitive development are a major concern. The role of nutrition is considered to be an adjunct to reduction of environmental lead exposure, which is the primary means of reducing adverse health effects of lead. Nutrition should be evaluated as a component of strategies to address this broad societal issue.

Trotter, II, R.T. (1990), The cultural parameters of lead poisoning: A medical anthropologist’s view of intervention in environmental lead exposure. *Environmental Health Perspectives*, **89**, 79-84.

Full Text: [1990\Env Hea Per89, 79.pdf](1990/Env%20Hea%20Per89,%2079.pdf)

Abstract: This article identifies four culturally shaped sources of lead exposure in human societies: modern and historic technological sources; food habits; culturally defined health beliefs; and beauty practices. Examples of these potential sources of lead poisoning are presented from current cultures. They include the use of lead-glazed cooking pottery in Mexican-American households; folk medical use of lead in Hispanic, Arabic, South Asian, Chinese, and Hmong communities; as well as the use of lead as a cosmetic in the Near East, Southeast Asia, and South Asia. Four interacting cultural conditions that create barriers to the reduction of lead exposure and lead poisoning are identified and discussed. These are knowledge deficiencies, communication resistance, cultural reinterpretations, and incongruity of explanatory models.

Needleman, H.L. (1990), The future challenge of lead toxicity. *Environmental Health Perspectives*, **89**, 85-89.

Full Text: [1990\Env Hea Per89, 85.pdf](1990/Env%20Hea%20Per89,%2085.pdf)

Abstract: Five decades ago, lead toxicity in childhood was thought in nonlethal cases to be without residual effect. This misconception was corrected in 1943 by Randolph Byers, who began the modern era of lead neurotoxicology by asserting that lead not only killed cells, but interfered with the normal development of central nervous system neurons. The human data from Byers forward is reviewed, with particular attention on methodological issues that have emerged. The papers on human neurotoxicology presented at the NIEHS lead conference held in Research Triangle Park, NC, in 1974 are examined to demonstrate the progress made over the last 15 years. Seven methodological solecisms have clouded judgment over the question of lead toxicity at low dose: worship of the sacrament of p=0.05; inaccurate causal modeling; drawing conclusions from studies with inadequate power; positing phantom covariates; underestimating the importance of “small” effects; demanding proof of causality; and evaluating studies in isolation. The principles behind these errors are discussed. Lead exposure is associated with hyperactivity, and hyperactivity is a risk factor for antisocial behavior. The relationship between lead exposure and antisocial behavior is estimated. A plan for the effective removal of one major lead source, housing stock, is presented.

Goldstein, G.W. (1990), Lead poisoning and brain cell function. *Environmental Health Perspectives*, **89**, 91-94.

Full Text: [1990\Env Hea Per89, 91.pdf](1990/Env%20Hea%20Per89,%2091.pdf)

Abstract: Exposure to excessive amounts of inorganic lead during the toddler years may produce lasting adverse effects upon brain function. Maximal ingestion of lead occurs at an age when major changes are occurring in the density of brain synaptic connections. The developmental reorganization of synapses is, in part, mediated by protein kinases, and these enzymes are particularly sensitive to stimulation by lead. By inappropriately activating specific protein kinases, lead poisoning may disrupt the development of neural networks without producing overt pathological alterations. The blood-brain barrier is another potential vulnerable site for the neurotoxic action of lead. Protein kinases appear to regulate the development of brain capillaries and the expression of the blood-brain barrier properties. Stimulation of protein kinase by lead may disrupt barrier development and alter the precise regulation of the neuronal environment that is required for normal brain function. Together, these findings suggest that the sensitivity of protein kinases to lead may in part underlie the brain dysfunction observed in children poisoned by this toxicant.

Keywords: Protein Kinase-C, Immature Rat-Brain, Microvessels, Capillaries, Calmodulin, Exposure, Release, Cyclase, Barrier, Model

Graziano, J.H., Popovac, D., Factor-Litvak, P., Shrout, P., Kline, J., Murphy, M.J., Zhao, Y.H., Mehmeti, A., Ahmedi, X., Rajovic, B., Zvicer, Z., Nenezic, D.U., Lolacono, N.J. and Stein, Z. (1990), Determinants of elevated blood lead during pregnancy in a population surrounding a lead smelter in Kosovo, Yugoslavia. *Environmental Health Perspectives*, **89**, 95-100.

Full Text: [1990\Env Hea Per89, 95.pdf](1990/Env%20Hea%20Per89,%2095.pdf)

Abstract: We are prospectively examining the relation between environmental lead exposure and pregnancy outcome in cohorts of women exposed to a wide range of air lead concentrations. Titova Mitrovica, Yugoslavia, is the site of a large lead smelter, refinery, and battery factory. At midpregnancy, 602 women in T. Mitrovica and 900 women in Pristina, a non-lead-exposed control town, were interviewed. Blood was obtained for blood lead (PbB), hemoglobin, erythrocyte protoporphyrin, and serum ferritin measurements. Women were seen again at delivery, at which time maternal and umbilical cord blood samples were obtained. While many demographic and social characteristics were similar across the two towns, women in Pristina were more likely to report employment outside the home, cigarette smoking, and alcohol use during pregnancy. As expected, PbB levels were substantially higher in the smelter town. At midpregnancy, PbB geometric means were 17.1,g/dL in T. Mitrovica and 5.1 Ag/dL in Pristina; 86% of the pregnant women in T. Mitrovica, compared to 3.4% of those in Pristina, had PbB levels > 10 ytg/dL. Within T. Mitrovica, distance between the home and the smelter was the most important predictor of PbB at mid-pregnancy and delivery. Husband’s employment in the lead industry was associated with a significant increase in maternal PbB levels independent of place of residence. Higher maternal serum ferritin concentrations were associated with lower PbB levels, suggesting that dietary iron inhibits lead absorption. Overall, the placenta was a poor barrier to lead; the relationship between maternal PbB and umbilical cord PbB was linear across a wide range of PbB levels.

Goyer, R.A. (1990), Transplacental transport of lead. *Environmental Health Perspectives*, **89**, 101-105.

Full Text: [1990\Env Hea Per89, 101.pdf](1990/Env%20Hea%20Per89,%20101.pdf)

Abstract: Neurotoxicity is the major health effect from exposure to lead for infants and young children, and there is current concern regarding possible toxic effects of lead on the child while in utero. There is no placentalfetal barrier to lead transport. Maternal and fetal blood lead levels are nearly identical, so lead passes through the placenta unencumbered. Lead has been measured in the fetal brain as early as the end of the first trimester (13 weeks). There is a similar rate of increase in brain size and lead content throughout pregnancy in the fetus of mothers in the general population, so concentration of lead probably does not differ greatly during gestation unless exposure of the mother changes. Cell-specific sensitivity to the toxic effects of lead, however, may be greater the younger the fetus. Lead toxicity to the nervous system is characterized by edema or swelling of the brain due to altered permeability of capillary endothelial cells. Experimental studies suggest that immature endothelial cells forming the capillaries of the developing brain are less resistant to the effects of lead, permitting fluid and cations including lead to reach newly formed components of the brain, particularly astrocytes and neurons. Also, the ability of astrocytes and neurons to sequester lead in the fonn of lead protein complexes occurs only in the later stages of fetal development, permitting lead in maturing brain cells to interact with vital subcellular organelles, particularly mitochondria, which are the major cellular energy source. Intracellular lead also affects binding sites for calcium which, in turn, may affect numerous cell functions including neurotransmitter release.

Crocetti, A.F., Mushak, P. and Schwartz, J. (1990), Determination of numbers of lead-exposed U.S. children by areas of the United States: An integrated summary of a report to the U.S. congress on childhood lead poisoning. *Environmental Health Perspectives*, **89**, 109-120.

Full Text: [1990\Env Hea Per89, 109.pdf](1990/Env%20Hea%20Per89,%20109.pdf)

Abstract: In response to Congressional mandate and under the aegis of the Federal Agency for Ibxic Substances and Disease Registry (AISDR), a comprehensive report to Congress on childhood lead poisoning in the United States was prepared. We have examined numbers of lead-exposed U.S. children by socioeconomic/demographic strata for children 0.5 to 5 years of age; by children in U.S. lead-screening programs; and by enumerations of children 0.5 to 5 years old in the oldest (ie., highest paint lead and lead plumbing) housing. Using blood lead (PbB) prevalence projection modeling and data of the Second National Health and Nutrition Examination Survey (NHANES II), it is estimated for 1984 that 2.4 million black and white children 0.5 to 5 years old in metropolitan U.S. had PbB levels > 15 Ag/dL. For all races and the entire nation, we estimate 3 to 4 million children will have PbB levels > 15 Ag/dL. Inner-city, low-income children have the highest prevalences of PbB levels above this criterion level, but sizable numbers of all strata of children have elevated PbB levels when considering both base populations and prevalences for the specific strata (total of 30 strata). Lead screening programs indicate much lower numbers of exosed children compared to NHANES II-based projections, for various reasons that allow programs to underestimate true prevalences. Analysis of 1980 U.S. Census Bureau housing data for 318 standard metropolitan statistical areas show that 4.4 million children 0.5 to 5 years old live in the oldest U.S. housing (pre-1950). Of these, most are actually in the more affluent socioeconomic strata.

Crocetti, A.F., Mushak, P. and Schwartz, J. (1990), Determination of numbers of lead-exposed women of childbearing age and pregnant women: An integrated summary of a report to the U.S. congress on childhood lead poisoning. *Environmental Health Perspectives*, **89**, 121-124.

Full Text: [1990\Env Hea Per89, 121.pdf](1990/Env%20Hea%20Per89,%20121.pdf)

Abstract: In a Congressionally mandated study carried out under the aegis of the U.S. Agency for Toxic Substances and Disease Registry (AISDR) and summarized in this article, the authors have provided estimates of the numbers of American women of childbearing age and the numbers of American pregnant women whose lead exposure is sufficiently elevated to pose an intrauterine toxicity risk. Exposures associated with such risk were defined as blood lead (PbB) levels > 10, > 15, > 20, and > 25 ig/dL. Using PbB prevalence projection techniques based on the Second National Health and Nutrition Examination Survey (NHANES II), we first generated projected 1984 prevalences of these PbB levels in white and black women of childbearing age, ages 15 to 19 and 20 to 44. White women in the two age bands had rates of PbBs > 10 ig/dL of 9.2 and 9.7%, respectively. For black women, the corresponding rates were 8.2 and 19.7%, respectively. Combining these rates with standard metropolitan statistical areas (SMSAs) based 1980 Census and other population enumerations show, for example,that 4.4 million U.S. women of childbearing age are estimated to have had PbBs > 10 /ig/dL. Pregnant black and white women in U.S. SMSAs are approximately 9%o of the U.S. black and white childbearing age total, i.e., 3.6 million out of a 41.3 million SMSA total. Of these, 403,200 pregnant women were estimated to have PbB levels > 10 4g/dL. Cumulative totals of exposed fetuses with persisting long-term exposure will be greater, in as much as a given fetus is never counted more than once in this type of survey. Over 10 years, the number would be over 4 million fetuses at elevated risk of health effects.

Mushak, P. and Crocetti, A.F. (1990), Methods for reducing lead exposure in young children and other risk groups: An integrated summary of a report to the U.S. congress on childhood lead poisoning. *Environmental Health Perspectives*, **89**, 125-135.

Full Text: [1990\Env Hea Per89, 125.pdf](1990/Env%20Hea%20Per89,%20125.pdf)

Abstract: As part of a Congressionally mandated report on U.S. childhood lead poisoning prepared by the Federal govemment (U.S. Agency for Txic Substances and Disease Registry [ATSDR]), the authors have analyzed the relative effectiveness of measures to reduce source-specific lead exposure of U.S. children. An integrated overview of this analysis is presented in this article. Two national actions, the Federally mandated phasedown of lead in gasoline by the U.S. Environmental Protection Agency and the voluntary phasedown of lead use in domestic food can production, are examples of centrally directed initiatives that have been relatively successful in limiting childhood lead exposure in the U.S. Efforts to abate lead-based paint exposure of children have largely failed. This is especially true for the nations 21 million residential units with the highest lead content paint. Similarly, abatement of lead exposure from contaminated dusts and soils has generally been unsuccessful. Comprehensive measures to reduce lead exposure from drinking water in residences and public facilities, e.g., elementary schools, are only now being promulgated or implemented. The full extent of their effectiveness remains to be demonstrated. There are many miscellaneous but potentially severe exposure sources that are difficult to control but require attention, such as poorly glazed foodware and ethno-specific preparations.

? Dunn, B.P. (1991), Carcinogen adducts as an indicator for the public health risks of consuming carcinogen-exposed fish and shellfish. *Environmental Health Perspectives*, **90**, 111-116.

Full Text: [1991\Env Hea Per90, 111.pdf](1991/Env%20Hea%20Per90,%20111.pdf)

Abstract: A large variety of environmental carcinogens are metabolically activated to electrophilic metabolites that can bind to nucleic acids and protein, forming covalent adducts. The formation of DNA-carcinogen adducts is thought to be a necessary step in the action of most carcinogens. Recently, a variety of new fluorescence, immunochemical, and radioactive-postlabeling procedures have been developed that allow the sensitive measurement of DNA-carcinogen adducts in organisms exposed to environmental carcinogens. In some cases, similar procedures have been developed for protein-carcinogen adducts. In an organism with active metabolic systems for a given carcinogen, adducts are generally much longer lived than the carcinogens that formed them. Thus, the detection of DNA-or protein-carcinogen adducts in aquatic foodstuffs can act as an indicator of prior carcinogen exposure. The presence of DNA adducts would, in addition, suggest a mutagenic/carcinogenic risk to the aquatic organism itself. Vertebrate fish are characterized by high levels of carcinogen metabolism, low body burdens of carcinogen, the formation of carcinogen-macromolecule adducts, and the occurrence of pollution-related tumors. Shellfish, on the other hand, have low levels of carcinogen metabolism, high body burdens of carcinogen, and have little or no evidence of carcinogen-macromolecule adducts or tumors. The consumption of carcinogen adducts in aquatic foodstuffs is unlikely to represent a human health hazard. There are no metabolic pathways by which protein-carcinogen or DNA-carcinogen adducts could reform carcinogens. Incorporation via salvage pathways of preformed nucleoside-carcinogen adducts from foodstuffs into newly synthesized human DNA is theoretically possible. (ABSTRACT TRUNCATED AT 250 WORDS)

? Huff, J., Bucher, J. and Yang, R. (1991), Carcinogenesis studies in rodents for evaluating risks associated with chemical carcinogens in aquatic food animals. *Environmental Health Perspectives*, **90**, 127-132.

Full Text: [1991\Env Hea Per90, 127.pdf](1991/Env%20Hea%20Per90,%20127.pdf)

Abstract: Fish and shellfish caught in polluted waters contain potentially dangerous amounts of toxic and carcinogenic chemicals. Public concern was heightened when a large percentage of winter flounder taken from Boston Harbor was found to have visible cancer of the liver, winter flounder outside the estuary area had no liver lesions. Long-term chemical carcinogenesis studies could be easily and feasibly designed using laboratory rodents offered diets containing fish caught in polluted waters. Induced cancers in rodents would corroborate field observations in fish, positive results from these studies would provide further evidence about potential human health hazards from eating substantial amounts of chemically contaminated fish. Nonetheless, fish and aquatic organisms should be viewed as environmental biological monitors of pollution or of potential human health hazards, and authorities responsible for assuring clean and safe rivers, bodies of water, and biota should give more attention to these valid biological indicators or sentinels of environmental pollution. Consequently, fish and other sea creatures alone should serve as alarms regarding whether water areas constitute public health hazards.

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Full Text: [1991\Env Hea Per90, 141.pdf](1991/Env%20Hea%20Per90,%20141.pdf)

Abstract: Epidemiologic approaches to assessing human cancer risk from consuming fish from contaminated waters must confront the problems of long latency and rarity of the end point (cancer). The latency problem makes determination of diet history more difficult, while the low frequency of cancer as an end point reduces the statistical power of the study. These factors are discussed in relation to the study designs most commonly employed in epidemiology. It is suggested that the use of biomarkers for persistent chemicals may be useful to mitigate the difficulty of determining exposure, while the use of more prevalent and timely end points, such as carcinogen-DNA adducts or oncogene proteins, may make the latency and rarity problems more tractable.

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Full Text: [1991\Env Hea Per90, 215.pdf](1991/Env%20Hea%20Per90,%20215.pdf)

Abstract: Heterogeneity, ranging from measurement error to variation among individuals or regions, influences all levels of data collected for risk assessment. In its role as a nemesis, heterogeneity can reduce the precision of estimates, change the shape of a population model, or reduce the generalizability of study results. In many contexts, however, heterogeneity is the primary object of inference. Indeed, some degree of heterogeneity in excess of a baseline amount associated with a statistical model is necessary in order to identify important determinants of response. This report outlines the causes and influences of heterogeneity, develops statistical methods used to estimate and account for it, discusses interpretations of heterogeneity, and shows how it should influence study design. Examples from dose-response modeling, identification of sensitive individuals, assessment of small area variations and meta analysis provide applied contexts.

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Full Text: [1991\Env Hea Per91, 141.pdf](1991/Env%20Hea%20Per91,%20141.pdf)

Abstract: This paper compares four alternative approaches for deriving regulatory levels for reproductive toxicants by applying them to the available data on the human spermatotoxicant 1,2-dibromo-3-chloropropane (DBCP). The alternatives examined include the Proposition 65 approach (application of a mandatory 1000-fold uncertainty factor to a no-observed-adverse-effect level [NOAEL]), the Environmental Protection Agency (EPA) approach (application of flexible uncertainty factors to a NOAEL), the Benchmark Dose approach (application of flexible uncertainty factors to a dose associated with a known level of change in a reproductive parameter), and the Quantitative Risk Estimation approach (using low-dose linear extrapolation and a model of the relationship between sperm count and infertility). Applied to DBCP, these approaches do not produce substantially different estimates of allowable exposure levels. However, the approaches do have different data requirements and provide different amounts of information on reproductive hazards to risk managers and the public. Neither the Proposition 65 nor the EPA approach provides information about the extent of health risk remaining at a regulatory level. In contrast, the Benchmark Dose approach can provide estimates of the magnitude of sperm count reduction at a regulatory level, and the Quantitative Risk Estimation approach can provide estimates of exposure-induced infertility.

? La Velle, J.M. (1991), Mechanisms of toxicity/carcinogenicity and Superfund decisions. *Environmental Health Perspectives*, **92**, 127-130.

Full Text: [1991\Env Hea Per92, 127.pdf](1991/Env%20Hea%20Per92,%20127.pdf)

Abstract: Heavy metals that contaminate soils and water usually exist in various oxidation states and form a number of compounds with different physical and chemical characteristics. These differences are often reflected in dramatic variation in toxicokinetic and biologic properties. Such variation in properties, critical in determining intrinsic toxicity, often causes a great deal of uncertainty in analyses of public health risks at sites where metal exposure is evaluated. In the Superfund program, such uncertainties may substantially undermine attempts to characterize potential impacts to populations exposed to metals from improperly disposed waste. In the case of chromium, risk assessment uncertainties can be considerable and fall generally into two categories. First, there is almost no information on potential health effects due to chronic oral exposure to chromium-containing compounds, and a nonquantifiable and probably large uncertainty exists in establishing no-effect levels. In fact, reference doses (RfDs) for CrIII and CrVI are based on chronic studies in which no adverse effects were seen even at the highest dose. Considerations of bioavailability, deduced from site characterization data, and acute toxicity indicate that general application of these RfDs may lead to highly inaccurate estimations of risk. Second, because of the ready reduction of CrVI in biological systems, it has not been possible to separate effects of CrVI from those of CrIII. Thus, data on the relative toxicity and carcinogenicity of these two species is sparse and difficult to interpret. Moreover, kinetic considerations make it difficult to determine the site and rates of reduction of CrVI. This makes prediction of target site concentrations of the two species difficult. (ABSTRACT TRUNCATED AT 250 WORDS)

? Burke, T., Fagliano, J., Goldoft, M., Hazen, R.E., Iglewicz, R. and McKee, T. (1991), Chromite ore processing residue in Hudson County, New Jersey. *Environmental Health Perspectives*, **92**, 131-137.

Full Text: [1991\Env Hea Per92, 131.pdf](1991/Env%20Hea%20Per92,%20131.pdf)

Abstract: Chromite ore processing residue occurs at over 130 sites in Hudson County, New Jersey. Many of these sites are in urban residential areas. This waste is a result of 70 years of chromate and bichromate chemical manufacturing. At least 15% of the sites contain total chromium concentrations greater than 10,000 mg/kg, with hexavalent content ranging from about 1 to 50%. Continuing leaching of this waste results in yellow-colored surface water runoff and yellow deposits on the soil surface and inside basement walls. The chemistry, environmental fate, health effects, and human exposure potentials for this waste are described.

? Sedman, R.M. and Esparza, J.R. (1991), Evaluation of volatile organic emissions from hazardous waste incinerators. *Environmental Health Perspectives*, **94**, 169-80.

Full Text: [1991\Env Hea Per94, 169.pdf](1991/Env%20Hea%20Per94,%20169.pdf)

Abstract: Conventional methods of risk assessment typically employed to evaluate the impact of hazardous waste incinerators on public health must rely on somewhat speculative emissions estimates or on complicated and expensive sampling and analytical methods. The limited amount of toxicological information concerning many of the compounds detected in stack emissions also complicates the evaluation of the public health impacts of these facilities. An alternative approach aimed at evaluating the public health impacts associated with volatile organic stack emissions is presented that relies on a screening criterion to evaluate total stack hydrocarbon emissions. If the concentration of hydrocarbons in ambient air is below the screening criterion, volatile emissions from the incinerator are judged not to pose a significant threat to public health. Both the screening criterion and a conventional method of risk assessment were employed to evaluate the emissions from 20 incinerators. Use of the screening criterion always yielded a substantially greater estimate of risk than that derived by the conventional method. Since the use of the screening criterion always yielded estimates of risk that were greater than that determined by conventional methods and measuring total hydrocarbon emissions is a relatively simple analytical procedure, the use of the screening criterion would appear to facilitate the evaluation of operating hazardous waste incinerators.

Notes: highly cited

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Full Text: [1992\Env Hea Per97, 259.pdf](1992/Env%20Hea%20Per97,%20259.pdf)

Abstract: Ingestion of arsenic, both from water supplies and medicinal preparations, is known to cause skin cancer. The evidence assessed here indicates that arsenic can also cause liver, lung, kidney, and bladder cancer and that the population cancer risks due to arsenic in U.S. water supplies may be comparable to those from environmental tobacco smoke and radon in homes. Large population studies in an area of Taiwan with high arsenic levels in well water (170-800 µg/L) were used to establish dose-response relationships between cancer risks and the concentration of inorganic arsenic naturally present in water supplies. It was estimated that at the current EPA standard of 50-mu-g/L, the lifetime risk of dying from cancer of the liver, lung, kidney, or bladder from drinking 1 L/day of water could be as high as 13 per 1000 persons. It has been estimated that more than 350,000 people in the United States may be supplied with water containing more than 50 µg/L arsenic, and more than 2.5 million people may be supplied with water with levels above 25 µg/L. For average arsenic levels and water consumption patterns in the United States, the risk estimate was around 1/1000. Although further research is needed to validate these findings, measures to reduce arsenic levels in water supplies should be considered.

Keywords: Induced Adenoma Formation, Disease Endemic Area, Artesian Well Water, Malignant Neoplasms, Occupational Exposure, Blackfoot Disease, Hepatic Angiosarcoma, Urinary-Excretion, Fowlers Solution, Sodium Arsenite

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Full Text: [1993\Env Hea Per101, 297.pdf](1993/Env%20Hea%20Per101,%20297.pdf)

Abstract: A small proportion of fishery products contaminated with appreciable amounts of potentially hazardous inorganic and organic contaminants from natural and environmental sources seem to pose the greatest potential for toxicity to consumers of fishery products in the United States. Health risks due to chemicals (e.g., modest changes in the overall risk of cancer, subtle deficits of neurological development in fetuses and children) are difficult to measure directly in people exposed to low levels. Immunocompetence may increase cancer risk. Inferences about the potential magnitude of these problems must be based on the levels of specific chemical present, observations of human populations and experimental animals exposed to relatively high doses, and theories about the likely mechanisms of action of specific intoxicants and the population distribution of sensitivity of human exposure. Lognormal distributions were found to provide good descriptions of the pattern of variation of contaminant concentrations among different species and geographic areas, this variability offers a solution for reduction of exposure through restricting harvest of aquatic animals from certain sites and by excluding certain species. Available information suggest that risks are not generally of high magnitude, nevertheless, their control will significantly improve public health. (ABSTRACT TRUNCATED AT 250 WORDS)

Rothman, K.J. (1993), Methodologic frontiers in environmental epidemiology. *Environmental Health Perspectives*, **101** (S4), 19-21.

Full Text: [1993\Env Hea Per101, 19.pdf](1993/Env%20Hea%20Per101,%2019.pdf)

Abstract: Environmental epidemiology comprises the epidemiologic study of those environmental factors that are outside the immediate control of the individual. Exposures of interest to environmental epidemiologists include air pollution, water pollution, occupational exposure to physical and chemical agents, as well as psychosocial elements of environmental concern. The main methodologic problem in environmental epidemiology is exposure assessment, a problem that extends through all of epidemiologic research but looms as a towering obstacle in environmental epidemiology. One of the most promising developments in improving exposure assessment in environmental epidemiology is to find exposure biomarkers, which could serve as built-in dosimeters that reflect the biologic footprint left behind by environmental exposures. Beyond exposure assessment, epidemiologists studying environmental exposures face the difficulty of studying small effects that may be distorted by confounding that eludes easy control. This challenge may prompt reliance on new study designs, such as two-stage designs in which exposure and disease information are collected in the first stage, and covariate information is collected on a subset of subjects in state two. While the analytic methods already available for environmental epidemiology are powerful, analytic methods for ecologic studies need further development. This workshop outlines the range of methodologic issues that environmental epidemiologists must address so that their work meets the goals set by scientists and society at large.

Akland, G.G. (1993), Exposure of the general population to gasoline. *Environmental Health Perspectives*, **101** (S6), 27-32.

Full Text: [1993\Env Hea Per101, 27.pdf](1993/Env%20Hea%20Per101,%2027.pdf)

Abstract: This paper summarizes the currently available information on gasoline exposure to the general population. In general, the largest contribution to the time weighted exposures results from exposures while indoors, which are influenced by the outside air, indoor sources, and attached garages. Personal activities, including refueling and commuting, contribute significantly higher exposures but last for only a small portion of the 24-hr time weighted average. The highest exposed group includes those individuals living near large service stations and those with contaminated water supplies.

Notes: highly cited

? Colborn, T., Saal, F.S.V. and Soto, A.M. (1993), Developmental effects of endocrine disrupting chemicals in wildlife and humans. *Environmental Health Perspectives*, **101** (5), 378-384.

Full Text: [1993\Env Hea Per101, 378.pdf](1993/Env%20Hea%20Per101,%20378.pdf)

Abstract: Large numbers and large quantities of endocrine-disrupting chemicals have been released into the environment since World War II. Many of these chemicals can disturb development of the endocrine system and of the organs that respond to endocrine signals in organisms indirectly exposed during prenatal and/or early postnatal life; effects of exposure during development are permanent and irreversible. The risk to the developing organism can also stem from direct exposure of the offspring after birth or hatching. In addition, transgenerational exposure can result from the exposure of the mother to a chemical at any time throughout her life before producing offspring due to persistence of endocrine-disrupting chemicals in body fat, which is mobilized during egg laying or pregnancy and lactation. Mechanisms underlying the disruption of the development of vital systems, such as the endocrine, reproductive, and immune systems, are discussed with reference to wildlife, laboratory animals, and humans.

Keywords: 2,3,7,8-Tetrachlorodibenzo-Para-Dioxin Tcdd, Animals, Birth, Chemical, Chemicals, Chlordecone Kepone, Developing, Development, Developmental Effects, Diethylstilbestrol, Differentiation, Endocrine Function, Endocrine System, Environment, Estrogen, Exposure, Fertility, Great-Lakes, Herring-Gulls, Hormones, Humans, Immune, Lactation, Lactational Exposure, Life, Male-Rats, Mechanisms, Mono(2-Ethylhexyl) Phthalate, Mother, Nucella-Lapillus, Organochlorines, Permanent, Persistence, Pesticides, Phenolics, Polychlorinated-Biphenyls Pcbs, Postnatal, Pregnancy, Prenatal, Reference, Reproductive Function, Reproductive-Tract, Risk, Systems, Wildlife

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Full Text: [1993\Env Hea Per101, 584.pdf](1993/Env%20Hea%20Per101,%20584.pdf)

Sedman, R.M., Polisini, J.M. and Esparza, J.R. (1994), The evaluation of stack metal emissions from hazardous waste incinerators: Assessing human exposure through noninhalation pathways. *Environmental Health Perspectives*, **102** (S2), 105-112.

Full Text: [1994\Env Hea Per102, 105.pdf](1994/Env%20Hea%20Per102,%20105.pdf)

Abstract: Potential public health effects associated with exposure to metal emissions from hazardous waste incinerators through noninhalation pathways were evaluated. Instead of relying on modeling the movement of toxicants through various environmental media, an approach based on estimating changes from baseline levels of exposure was employed. Changes in soil and water As, Cd, Hg, Pb, Cr, and Be concentrations that result from incinerator emissions were first determined. Estimates of changes in human exposure due to direct contact with shallow soil or the ingestion of surface water were then ascertained. Projected changes in dietary intakes of metals due to incinerator emissions were estimated based on changes from baseline dietary intakes that are monitored in U.S. Food and Drug Administration total diet studies. Changes from baseline intake were deemed to be proportional to the projected changes in soil or surface water metal concentrations. Human exposure to metals emitted from nine hazardous waste incinerators were then evaluated. Metal emissions from certain facilities resulted in tangible human exposure through noninhalation pathways. However, the analysis indicated that the deposition of metals from ambient air would result in substantially greater human exposure through noninhalation pathways than the emissions from most of the facilities.

Schaefer, M. (1994), Children and toxic substances: Confronting a major public health challenge. *Environmental Health Perspectives*, **102** (S2), 155-156.

Full Text: [1994\Env Hea Per102, 155.pdf](1994/Env%20Hea%20Per102,%20155.pdf)

Abstract: Despite early warnings of lead toxicity, until recently this metal was added to a variety of consumer and industrial products. Today, thousands of children in the United States, and probably tens of thousands more worldwide, are suffering the consequences of exposure to lead. The lead story looms as major public policy failure that will eventually cost billions of dollars to remedy. Little is known about the toxicological properties of the more than 70,000 chemicals in commerce. Consequently, it seems likely that other “leads” are finding their way into our food, water, and air. Inadequate testing of chemicals to which the public is exposed presents a serious public health risk, particularly to children whose nervous systems are still developing. The Federal government should expand toxicological testing programs for existing and new chemicals, requiring increased developmental toxicological, particularly neurotoxicological, testing of chemicals to which the public is significantly exposed. In keeping with the concept of full-cost pricing, the costs of these tests should be incurred by the manufacturer, not the government, and should be considered a routine cost of product development.

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Full Text: [1994\Env Hea Per102, 940.pdf](1994/Env%20Hea%20Per102,%20940.pdf)

Abstract: This review discusses recent literature on the chemical and physiological factors that influence the absorption, distribution, and excretion of aluminum in mammals, with particular regard to gastrointestinal absorption and speciation in plasma. Humans encounter aluminum, a ubiquitous yet highly insoluble element in most forms, in foods, drinking water, and pharmaceuticals. Exposure also occurs by inhalation of dust and aerosols, particularly in occupational settings. Absorption from the gut depends largely on pH and the presence of complexing ligands, particularly carboxylic acids, with which the metal can form absorbable neutral aluminum species. Uremic animals and humans experience higher than normal body burdens of aluminum despite increased urinary clearance of the metal. In plasma, 80-90% of aluminum binds to transferrin, an iron-transport protein for which receptors exist in many tissue. The remaining fraction of plasma aluminum takes the form of small-molecule hydroxy species and small complexes with carboxylic acids, phosphate, and, to a much lesser degree, amino acids. Most of these species have not been observed in vivo but are predicted from equilibrium models derived from potentiometric methods and NMR investigations. These models predict that the major small-molecule aluminum species under plasma conditions are charged and hence unavailable for uptake into tissues.

Keywords: Absorption, Aluminum, Citrate, Equilibrium Modeling, NMR, Pharmacokinetics, Plasma, Speciation, Transferrin, Uremia, Nuclear Magnetic-Resonance, Hydroxy Carboxylic-Acids, Accelerator Mass-Spectrometry, Potential Significance Invivo, Alzheimers-Disease, Drinking-Water, Gastrointestinal Absorption, Intestinal-Absorption, Iron Uptake, Transferrin Binding

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Full Text: [1994\Env Hea Per102, 958.pdf](1994/Env%20Hea%20Per102,%20958.pdf)

Abstract: During 1992 and 1993 the Wisconsin Division of Health investigated five cases in which copper-contaminated drinking water was suspected of causing gastrointestinal upsets. Each of these case studies was conducted after our office was notified of high copper levels in drinking water or notified of unexplained illnesses. Our findings suggest that drinking water that contains copper at levels above the federal action limit of 1.3 mg/l may be a relatively common cause of diarrhea, abdominal cramps, and nausea. These symptoms occurred most frequently in infants and young children and among resident of newly constructed or renovated homes.

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Full Text: [1994\Env Hea Per102, 45.pdf](1994/Env%20Hea%20Per102,%2045.pdf)

Abstract: Genetic diversity of a microbial community will inevitably be affected by environmental stress. However, our understanding of the implications of these effects is limited. Genetic exchange between natural microbial communities appears to be a common phenomenon, mediated by a number of microbial processes (conjugation, transformation, and transduction). These mechanisms of change are presumably adaptations to natural environmental perturbation, e.g., the low levels of antibiotics produced by other organisms. However, anthropogenic influences on the environment may be accelerating genetic change within microbiologic ecosystems, beyond these natural adaptation rates. This article highlights some of the perceived risks to ecosystem health and research questions that need to be addressed.

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Full Text: [1995\Env Hea Per103, 7.pdf](1995/Env%20Hea%20Per103,%207.pdf)

Abstract: Mishandling of hazardous wastes, like their unauthorized disposal in abandoned dump yards or sites, in river beds, estuaries or in the sea, causes substantial damage to the environment and its resources and, given the persistence and toxicity of these pollutants, they can seriously damage human health and quality of life. The importance of controlling management, transport, and disposal of toxic and hazardous substances in the years to come will be a crucial issue in the design and implementation of public policies. This is especially true for residents of such areas as the border between the United States and Mexico, where historically hazardous wastes have been a public health and environmental problem. The aim of this Conference on the Fate, Transport, and Interactions of Metals, A Joint United States-Mexico Conference, co-sponsored by the National Institute of Environmental Health Sciences, Superfund Basic Research Program, the National University of Mexico, Program for the Environment and the Pan American Health Organization, and hosted by the University of Arizona Center for Toxicology, College of Pharmacy, is to begin a joint effort by the United States and Mexico to better understand the complex problems related to heavy metals as hazardous wastes.

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Full Text: [1995\Env Hea Per103, 25.pdf](1995/Env%20Hea%20Per103,%2025.pdf)

Abstract: Microbe-metal interactions in aquatic environments and their exact role in transport and transformations of toxic metals are poorly understood. This paper will briefly review our understanding of these interactions. Ongoing research in Lake Chapala, Mexico, the major water source for the City of Guadalajara, provides an opportunity to study the microbiological aspects of metal-cycling in the water column. Constant resuspension of sediments provides a microbiologically rich aggregate-based system. Data indicate that toxic metals are concentrated on aggregate material and bioaccumulate in the food chain. A provisional model is presented for involvement of microbial aggregates in metal-cycling in Lake Chapala.

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Full Text: [1995\Env Hea Per103, 29.pdf](1995/Env%20Hea%20Per103,%2029.pdf)

Abstract: In this study we investigated the effects of competing trace metals and Ca2+ on Cd(II), Pb(II), and Cu(II) complexation by humic acid extracted from groundwater in Orange County, California. Two types of titration experiments were conducted, those using a single metal and those in which the humic acid had been preequilibrated with a competing metal (either a trace metal or Ca2+). The labile metal concentration in the titration was determined by differential pulse polarography (DPP). Results show the different effects of competing trace metal ions and the effect of Ca2+. Both trace metals and Ca2+ do not compete effectively with Cd(II) complexation. While no effects of Cu(II) on Pb(II) complexation were observed, the presence of Cd(II) appeared to slightly enhance the binding between Pb(II) and humic acid. The addition of Pb(II) decreased the amount of Cu(II) complexation, but Cd(II) caused a slight increase at the lower concentrations. Calcium, however, decreased the amount of complexation for all three metals. Results indicate that the metals are not necessarily competing for the same sites. Conformational changes that occur when trace metals bind to the different sites may cause this competing or enchanced effect. Since Ca(II) is introduced at two orders of magnitude higher in concentration than the trace metals, it can outcompete the trace metal for sites where electrostatic interactions dominate. The results indicate that in groundwater situations,where more than one metal is present, the effect of other metals must be considered in predicting metal speciation.

Keywords: Complexation, Humic Substances, Cadmium(II), Lead(II), Copper(II), Calcium

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Full Text: [1995\Env Hea Per103, 33.pdf](1995/Env%20Hea%20Per103,%2033.pdf)

Abstract: The concentrations of metals, Cd, Cu, Fe, Mn, Ni, Pb, and Zn were determined in some lagoons to establish the level of metal pollution. The lagoons studied were Alvarado lagoon, Veracruz, San Andres lagoon, Tamaulipas, and Terminos lagoon, Campeche. The concentrations were determined in water, oyster (Crassostrea virginica), and sediments. Metals were accumulated in either oysters or sediments. Cu and Zn were higher in oysters and Fe and Mn were higher in sediments. The results in water samples were compared with the limit established by the Secretaria de Ecologia and Desarrollo Urbane Report and briefly discussed.

Keywords: Heavy Metals, Water, Sediments, Oyster (Crassostrea Virginica), Adsorption, Uptake, Heavy-Metals, Trace, Tamaulipas, Virginica

Savitz, D.A., Andrews, K.W. and Pastore, L.M. (1995), Drinking water and pregnancy outcome in central North Carolina: Source, amount, and trihalomethane levels. *Environmental Health Perspectives*, **103** (6), 592-596.

Full Text: [1995\Env Hea Per103, 592.pdf](1995/Env%20Hea%20Per103,%20592.pdf)

Abstract: In spite of the recognition of potentially toxic chemicals in chlorinated drinking water, few studies have evaluated reproductive health consequences of such exposure. Using data from a case-control study of miscarriage, preterm delivery, and low birth weight in central North Carolina, we evaluated risk associated with water source, amount, and trihalomethane (THM) concentration. Water source was not related to any of those pregnancy outcomes, but an increasing amount of ingested water was associated with decreased risks of all three outcomes (odds ratios around 1.5 for 0 glasses per day relative to 1-3 glasses per day, falling to 0.8 for 4+ glasses per day). THM concentration and dose (concentration×amount) were not related to pregnancy outcome, with the possible exception of an increased risk of miscarriage in the highest sextile of THM concentration (adjusted odds ratio = 2.8, 95% confidence interval = 1.1-2.7), which was not part of an overall dose-response gradient. These data do not indicate a strong association between chlorination by-products and adverse pregnancy outcome, but given the limited quality of our exposure assessment and the increased miscarriage risk in the highest exposure group, more refined evaluation is warranted.

Knobeloch, L.M., Ziarnik, M., Anderson, H.A. and Dodson, V.N. (1995), Imported seabass as a source of mercury exposure: A Wisconsin case study. *Environmental Health Perspectives*, **103** (6), 604-606.

Full Text: [1995\Env Hea Per103, 604.pdf](1995/Env%20Hea%20Per103,%20604.pdf)

Abstract: The Wisconsin Division of Health investigated mercury exposure in a 40-year-old man, his 42-year-old wife, and their 2.5-year-old son. At the time of our investigation, these individuals had blood mercury levels ranging from 37 to 58 micrograms/L (normal < 5 micrograms/L) and hair samples from the adults contained 10-12 micrograms mercury/g dry weight. A personal interview and home inspection failed to identify any occupational or household sources of mercury exposure. The family’s diet included three to four fish meals per week. The fish was purchased from a local market and included Lake Superior whitefish, Lake Superior trout, farm-raised trout and salmon, and imported seabass. Analysis of these fish found that only one species, the imported seabass, contained significant mercury levels. Two samples of the seabass obtained from the vendor on different days contained mercury concentrations of 0.5 and 0.7 mg/kg. Based on consumption estimates, the average daily mercury intakes for these individuals ranged from 0.5 to 0.8 micrograms/kg body weight. Six months after the family stopped consuming the seabass, blood mercury levels in this man and woman were 5 and 3 micrograms/L, respectively. Analysis of sequential blood samples confirmed that mercury elimination followed first-order kinetics with a half-life of approximately 60 days.

Mushak, P. and Crocetti, A.F. (1995), Risk and revisionism in arsenic cancer risk assessment. *Environmental Health Perspectives*, **103** (7-8), 684-689.

Full Text: [1995\Env Hea Per103, 684.pdf](1995/Env%20Hea%20Per103,%20684.pdf)

Abstract: Oral exposures of nonoccupational populations to environmental Inorganic arsenic are associated with skin and internal cancers as well as various noncarcinogenic effects. Cancer risk assessments have been based largely on epidemiological studies of a large population exposed to Inorganic arsenic In well water in Taiwan. Criticisms and skepticism of the use of che Taiwanese data for estimating arsenic cancer risks outside of Taiwan, including potential use by the U.S. Environmental Protection Agency for regulatory purposes, have been expressed on various grounds. The nature and extent of such criticisms have sharpened with recent findings in the exposed Taiwanese of increased incidence of Internal cancers (bladder, kidney, liver, and lungi, in addition ro already-observed skin cancer, coupled with a good likelihood that these findings will produce more stringent arsenic regulation in the United Stares and elsewhere. These criticisms collectively posit a revisionist view that: 1) cancer Incidence among the Taiwanese was amplified by a number of host and environmental Factors not applicable elsewhere, 2) the cancer dose-response curve may not be linear at the lower exposures elsewhere, and 3) there is a toxicokinetic and metabolic threshold to cancer risk that was exceeded by the Taiwanese. However, a number of the arguments against wide use of the Taiwanese data are flawed and subject to challenge. We explore some of these arguments and their critical evaluation, particularly as they concern certain exposure, metabolic, and nutritional determinants of the cancer risk of inorganic arsenic in the Taiwanese.

Keywords: Drinking-Water, Thiol Methyltransferase, Methylation, Pharmacogenetics, Dehydration, Hypothesis, Ingestion, Exercise, Bladder, Liver

Romieu, I., Carreon, T., Lopez, L., Palazuelos, E., Rios, C., Manuel, Y. and Hernandez-Avila, M. (1995), Environmental urban lead exposure and blood lead levels in children of Mexico City. *Environmental Health Perspectives*, **103** (11), 1036-1040.

Full Text: [1995\Env Hea Per103, 1036.pdf](1995/Env%20Hea%20Per103,%201036.pdf)

Abstract: Lead contamination is now a leading public health problem in Mexico. However, there are few data on the lead content of various environmental sources, and little is known about the contribution of these sources to the total lead exposure in the population of children residing in Mexico City. We conducted a cross-sectional study in a random sample of 200 children younger than 5 years of age who lived in one of two areas of Mexico City. Environmental samples of floor, window, and street dust, paint, soil, water, and glazed ceramics were obtained from the participants’ households, as well as blood samples and dirt from the hands of the children. Blood lead levels ranged from 1 to 31 micrograms/dl with a mean of 9.9 micrograms/dl (SD 5.8 micrograms/dl). Forty-four percent of the children 18 months of age or older had blood lead levels exceeding 10 micrograms/dl. The lead content of environmental samples was low, except in glazed ceramic. The major predictors of blood lead levels were the lead content of the glazed ceramics used to prepare children’s food, exposure to airborne lead due to vehicular emission, and the lead content of the dirt from the children’s hands. We conclude that the major sources of lead exposure in Mexico City could be controlled by adequate public health programs to reinforce the use of unleaded gasoline and to encourage production and use of unleaded cookware instead of lead-glazed ceramics.

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Full Text: [1995\Env Hea Per103, 13.pdf](1995/Env%20Hea%20Per103,%2013.pdf)

Abstract: Estrogens are defined by their ability to induce the proliferation of cells of the female genital tract. The wide chemical diversity of estrogenic compounds precludes an accurate prediction of estrogenic activity on the basis of chemical structure. Rodent bioassays are not suited for the large-scale screening of chemicals before their release into the environment because of their cost, complexity, and ethical concerns. The E-SCREEN assay was developed to assess the estrogenicity of environmental chemicals using the proliferative effect of estrogens on their target cells as an end point. This quantitative assay compares the cell number achieved by similar inocula of MCF-7 cells in the absence of estrogens (negative control) and in the presence of 17 beta-estradiol (positive control) and a range of concentrations of chemicals suspected to be estrogenic. Among the compounds tested, several ‘‘new’’ estrogens were found; alkylphenols, phthalates, some PCB congeners and hydroxylated PCBs, and the insecticides dieldrin, endosulfan, and toxaphene were estrogenic by the E-SCREEN assay. In addition, these compounds competed with estradiol for binding to the estrogen receptor and increased the levels of progesterone receptor and pS2 in MCF-7 cells, as expected from estrogen mimics. Recombinant human growth factors (bFGF, EGF, IGF-1) and insulin did not increase cell yields. The aims of the work summarized in this paper were a) to validate the E-SCREEN assay; b) to screen a variety of chemicals present in the environment to identify those that may be causing reproductive effects in wildlife and humans; c) to assess whether environmental estrogens may act cumulatively; and finally d) to discuss the reliability of this and other assays to screen chemicals for their estrogenicity before they are released into the environment.

Keywords: Alkylphenols, Antioxidants, Binding, Bioassays, Breast-Tumor-Cells, Cancer-Cells, Cell Proliferation, Chemical, Chemicals, Chlordecone Kepone, Complexity, Control, Cost, Diversity, Endosulfan, Environment, Environmental, Estradiol, Estrogen, Estrogens, Ethical, Female, Female Genital Tract, Growth, Growth Factors, Human, Humans, IGF-1, Insecticides, Insulin, Mechanism, PCB, PCB-Congeners, PCBs, Phthalates, Prediction, Progesterone, Progesterone Receptor, Prolactin Synthesis, Proliferation, Receptors, Release, Reliability, Screening, Stimulation, Structure, Toxicology, Wildlife, Work, Xenobiotics

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Full Text: [1996\Env Hea Per104, 244.pdf](1996/Env%20Hea%20Per104,%20244.pdf)

Abstract: The countries of Eastern and Central Europe have emerged from a political system which for decades has ignored protection of human health from hazardous wastes. While the economies of the countries in this region are stretched, awareness and concern about hazardous waste issues are a part of the new realities. At a recent conference sponsored in part by the National Institute of Environmental Health Sciences, representatives of seven countries in the region described the status of hazardous waste programs, issues of major concern, and steps being taken to protect human health. This report summarizes the deliberations, outlines some of the problems remaining in dealing with the legacy of the past, addressing the problems of the present, and providing a framework for future research and collaborative efforts.

Keywords: Hazardous Wastes, Hospital Wastes, Incineration, Landfills, Municipal Wastes, Persistent Organics, Military Wastes, Cancer Mortality, Counties, Health, Sites

Notes: highly cited

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Full Text: [1996\Env Hea Per104, 362.pdf](1996/Env%20Hea%20Per104,%20362.pdf)

Abstract: The Agricultural Health Study, a large prospective cohort study, has been initiated in North Carolina and Iowa. The objectives of this study are to: 1) identify and quantify cancer risks among men, women, whites, and minorities associated with direct exposure to pesticides and other agricultural agents; 2) evaluate noncancer heath risks including neurotoxicity, reproductive effects, immunologic effects, nonmalignant respiratory disease, kidney disease, and growth and development among children; 3) evaluate disease risks among spouses and children of farmers that may arise from direct contact with pesticides and agricultural chemicals used in the home, lawns and gardens, and from indirect contact, such as spray drift, laundering work clothes, or contaminated food or water; 4) assess current and past occupational and nonoccupational agricultural exposures using periodic interviews and environmental and biologic monitoring, 5) study the relationship between agricultural exposures, biomarkers of exposure, biologic effect, and genetic susceptibility factors relevant to carcinogenesis; and 6) identify and quantify cancer and other disease risks associated with lifestyle factors such as diet, cooking practices, physical activity, smoking and alcohol consumption, and hair dye use. In the first year of a 3-year enrollment period, 26,235 people have been enrolled in the study including 19,776 registered pesticide applicators and 6,459 spouses of registered farmer applicators. It is estimated that when the total cohort is assembled in 1997 it will include approximately 75,000 adult study subjects. Farmers, the largest group of registered pesticide applicators, comprise 77% of the target population enrolled in the study. This experience compares favorably with enrollment rates of previous prospective studies.

Keywords: Cancers, Exposure Assessment, Farmers, Lymphoma, Noncancer Toxicity, Pesticides, Prospective Cohort, Cancer Mortality, Farmers, Canada, Risks

Hopenhayn-Rich, C., Biggs, M.L., Smith, A.H., Kalman, D.A. and Moore, L.E. (1996), Methylation study of a population environmentally exposed to arsenic in drinking water. *Environmental Health Perspectives*, **104** (6), 620-628.

Full Text: [1996\Env Hea Per104, 620.pdf](1996/Env%20Hea%20Per104,%20620.pdf)

Abstract: Methylation is considered the detoxification pathway for inorganic arsenic (InAs), an established human carcinogen. Urinary speciation analysis is used to assess the distribution of metabolites [monomethylarsonate (MMA), dimethylarsinate (DMA), and unmethylated arsenic (InAs)], as indicators of methylation capacity. We conducted a large biomarker study in northern Chile of a population chronically exposed to high levels of arsenic in drinking water. We report the results of the methylation study, which focused on the effects of exposure and other variables on the percent InAs, MMA, DMA, and the ratio of MMA to DMA in urine. The study consisted of 122 people in a town with arsenic water levels around 600 micrograms/l and 98 participants in a neighboring town with arsenic levels in water of about 15 micrograms/l. The corresponding mean urinary arsenic levels were 580 micrograms/l and 60 micrograms/l, of which 18.4% and 14.9% were InAs, respectively. The main differences were found for MMA: DMA, exposure, smoking, and being male were associated with higher MMA: DMA, while longer residence, Atacameño ethnicity, and being female were associated with lower MMA: DMA. Together, these variables explained about 30% of the variability in MMA: DMA. Overall, there was no evidence of a threshold for methylation capacity, even at very high exposures, and the interindividual differences were within a much wider range than those attributed to the variables investigated. The differences in percent InAs were small and within the ranges of other studies of background exposure levels. The biological significance of MMA: DMA, which was more than 1.5 times greater in the exposed group, and its relationship to sex, length of exposure, and ethnicity need further investigation because its relevance to health risk is not clear.

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Full Text: [1996\Env Hea Per104, 741.pdf](1996/Env%20Hea%20Per104,%20741.pdf)

Abstract: Male reproductive health has deteriorated in many countries during the last few decades. in the 1990s, declining semen quality has been reported from Belgium, Denmark, France, and Great Britain. The incidence of testicular cancer has increased during the same time. incidences of hypospadias and cryptorchidism also appear to be increasing. Similar reproductive problems occur in many wildlife species. There are marked geographic differences in the prevalence of male reproductive disorders. While the reasons for these differences are currently unknown, both clinical and laboratory research suggest that the adverse changes may be inter-related and have a common origin in fetal life or childhood. Exposure of the male fetus to supranormal levels of estrogens, such as diethlylstilbestrol, can result in the above-mentioned reproductive defects. The growing number of reports demonstrating that common environmental contaminants and natural factors possess estrogenic activity presents the working hypothesis that the adverse trends in male reproductive health may be, at least in part, associated with exposure to estrogenic or other hormonally active (e.g., antiandrogenic) environmental chemicals during fetal and childhood development. An extensive research program is needed to understand the extent of the problem, its underlying etiology, and the development of a strategy for prevention and intervention.

Keywords: Alkylphenol Polyethoxylate Surfactants, Belgium, Britain, Cancer, Changes, Chemicals, Childhood, Chromatography Mass-Spectrometry, Clinical, Contaminants, Denmark, Development, Dibenzo-P-Dioxins, Diethylstilbestrol Exposure Inutero, Endocrine Disruptors, Environment, Environmental, Environmental Contaminants, Estrogenic Chemicals, Etiology, Exposure, Fetal, Fetus, France, Health, Incidence, Intervention, Life, Luteinizing-Hormone Secretion, Male, Male Reproduction, Mullerian-Inhibiting Substance, Natural, Naturally-Occurring Estrogens, Origin, Pesticides, Polychlorinated-Biphenyls PCBs, Prevalence, Prevention, Quality, Reproductive Disorders, Reproductive Health, Research, Semen Quality, Species, Strategy, Testicular Neoplasms, Toxic Equivalency Factors, Trends, Turtle Sex Determination, Wildlife

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Full Text: [1996\Env Hea Per104, 756.pdf](1996/Env%20Hea%20Per104,%20756.pdf)

Abstract: Consumption of fish and shellfish from contaminated areas may be an important source of human exposure to persistent organohalogen compounds such as polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs), and polychlorinated dibenzofurans (PCDFs). We determined concentrations of 2,3,7,8-substituted PCDDs and PCDFs and 19 PCB congeners in whole blood samples from three groups of men, 40-54 years of age, with different consumption levels of crabs from a, F.J., ord area in southern Norway polluted with organochlorine compounds from a magnesium production plant. A significant increase of many PCDD/PCDF congeners was found in the blood when comparing the referents, moderate-, and high-intake groups. The greatest difference was observed for several of the PCDFs that are characteristic for the contamination of the marine biota of the, F.J., ord. PCBs, in general, play a minor role in the contamination of the, F.J., ord by the magnesium production process, except for the highly chlorinated congeners such as PCB-209. Nevertheless, almost all PCBs increased from the referents to the high-intake group. However, the relative concentrations of several highly chlorinated PCBs (particularly PCB-209) in blood are unexpectedly low compared to their abundance in crabs, indicating low uptake of these congeners. The exposure to PCDDs/PCDFs from crab consumption calculated from individual body burdens of these compounds were in good agreement with the intake estimated from previously measured concentrations in crabs, reported fishing sites, and consumption. Almost all subjects in the high-intake group exceeded the tolerable weekly intake of 35 pg TEQ/kg body weight/week proposed by a Nordic Expert Group.

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Full Text: [1996\Env Hea Per104, 1138.pdf](1996/Env%20Hea%20Per104,%201138.pdf)

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Full Text: [1996\Env Hea Per104, 1200.pdf](1996/Env%20Hea%20Per104,%201200.pdf)

Abstract: Inorganic arsenic (In-As), an occupational and environmental human carcinogen, undergoes biomethylation to monomethylarsonate (MMA) and dimethylarsinate (DMA). It has been proposed that saturation of methylation capacity at high exposure levels may lead to a threshold for the carcinogenicity of In-As. The relative distribution of urinary In-As, MMA, and DMA is used as a measure of human methylation capacity. The most common pathway for elevated environmental exposure to In-As worldwide is through drinking water. We conducted a biomarker study in northern Chile of a population chronically exposed to water naturally contaminated with high arsenic content (600 micrograms/l). In this paper we present the results of a prospective follow-up of 73 exposed individuals, who were provided with water of lower arsenic content (45 micrograms/l) for 2 months. The proportions of In-As, MMA, and DMA in urine were compared before and after intervention, and the effect of other factors on the distribution of arsenic metabolites was also analyzed. The findings of this study indicate that the decrease in arsenic exposure was associated with a small decrease in the percent In-As in urine (from 17.8% to 14.6%) and in the MMA/DMA ratio (from 0.23 to 0.18). Other factors such as smoking, gender, age, years of residence, and ethnicity were associated mainly with changes in the MMA/DMA ratio, with smoking having the strongest effect. Nevertheless, the factors investigated accounted for only about 20% of the large interindividual variability observed. Genetic polymorphisms in As-methylating enzymes and other co-factors are likely to contribute to some of the unexplained variation. The changes observed in the percent In-As and in the MMA/DMA ratio do not support an exposure-based threshold for arsenic methylation in humans.

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Full Text: [1997\Env Hea Per105, 294.pdf](1997/Env%20Hea%20Per105,%20294.pdf)

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Full Text: [1997\Env Hea Per105, 406.pdf](1997/Env%20Hea%20Per105,%20406.pdf)

Abstract: The area around the Pribram lead smelter has been recognized to be heavily contaminated by lead (Pb). In the early 1970s, several episodes of livestock lead intoxication were reported in this area, thereafter, several epidemiological and ecological studies focused on exposure of children. In contrast to earlier studies, the recent investigation (1992-1994) revealed significantly lower exposure to lead. From 1986-1990, recorded average blood lead levels were about 37.2 micrograms lead (Pb)/100 ml in an elementary school population living in a neighborhood close to the smelter (within 3 km of the plant). The present study, however, has found mean blood lead levels of 11.35 micrograms/100 ml (95% CI = 9.32, 13.82) among a comparable group of children. In addition to blood lead, tooth lead was used to assess exposure among children. Statistically significant differences (p < 0.05) were observed between the geometric mean tooth lead level of 6.44 micrograms Pb/g (n = 13, 95% CI = 3.95, 10.50) in the most contaminated zone and 1.43 micrograms Pb/g (n = 35, 95% CI = 1.11, 1.84) in zones farther away from the point source. Both biomarkers, blood and tooth lead levels, reflect a similar pattern of lead exposure in children. This study has attempted a quantitative assessment of risk factors associated with elevated lead exposure in the Czech Republic. Content of lead in soil, residential distance from the smelter, consumption of locally grown vegetables or fruits, drinking water from local wells, the mother’s educational level, cigarette consumption among family members, and the number of children in the family were factors positively related (p < 0.05) to blood lead levels. The resulting blood lead level was found to be inversely proportional to the child’s age.

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Full Text: [1997\Env Hea Per105, 424.pdf](1997/Env%20Hea%20Per105,%20424.pdf)

Abstract: To assess the impact of elevated levels of inorganic mercury in soil and dust and organic mercury in fish, biological monitoring was conducted among Native Americans living next to an inactive mercury mine in Clear Lake, California. of resident tribal members, 46% (n = 56) participated in biomonitoring. Urine mercury levels are equivalent to background, indicating that soil and dust exposures among study participants are not substantial. The average blood organic mercury level among study participants is 15.6±8.8 micrograms/l (n = 44), which is higher than levels reported by others among those who do not consume fish (2 micrograms/l). Consistent with results from other studies, a correlation between fish consumption and blood organic mercury is observed (p = 0.03). The margin between observed and established adverse effect levels for adults is examined for blood organic mercury and found to be less than 10-fold for 20% of the study population. Protective public health efforts for the study population and other similarly exposed populations, notably those who consume commercial fish products, are considered.

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Full Text: [1997\Env Hea Per105, 1060.pdf](1997/Env%20Hea%20Per105,%201060.pdf)

Abstract: This paper presents views on the current status of (inorganic) arsenic risk assessment in the United States and recommends research needed to set standards for drinking water. The opinions are those of the Arsenic Task Force of the Society for Environmental Geochemistry and Health, which has met periodically since 1991 to study issues related to arsenic risk assessment and has held workshops and international conferences on arsenic. The topic of this paper is made timely by current scientific interest in exposure to and adverse health effects of arsenic in the United States and passage of the Safe Drinking Water Act Amendments of 1996, which has provisions for a research program on arsenic and a schedule mandating the EPA to revise the maximum contaminant level of arsenic in drinking water by the year 2001. Our central premise and recommendations are straightforward: the risk of adverse health effects associated with arsenic in drinking water is unknown for low arsenic concentrations found in the United States, such as at the current interim maximum contaminant level of 50 µg/l and below. Arsenic-related research should be directed at answering that question. New epidemiological studies are needed to provide data for reliable dose-response assessments of arsenic and for skin cancer, bladder cancer, or other endpoints to be used by the EPA for regulation. Further toxicological research, along with the observational data from epidemiology, is needed to determine if the dose-response relationship at low levels is more consistent with the current assumption of low-dose linearity or the existence of a practical threshold. Other recommendations include adding foodborne arsenic to the calculation of total arsenic intake, calculation of total arsenic intake, and encouraging cooperative research within the United States and between the United States and affected countries.

Keywords: Arsenic, Cancer, Dose Response, Drinking Water, Food, Risk Assessment, Disease Endemic Area, Artesian Well Water, Drinking-Water, Malignant Neoplasms, Blackfoot Disease, Cancer Risk, Dose-Response, Skin-Cancer, Bladder, Taiwan

Till, M., Behnisch, P., Hagenmaier, H., Bock, K.W. and Schrenk, D. (1997), Dioxinlike components in incinerator fly ash: A comparison between chemical analysis data and results from a cell culture bioassay. *Environmental Health Perspectives*, **105** (12), 1326-1332.

Full Text: [1997\Env Hea Per105, 1326.pdf](1997/Env%20Hea%20Per105,%201326.pdf)

Abstract: Potent polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and dioxinlike polychlorinated biphenyls (PCBs) are among the most relevant toxic emissions from incinerators. Induction of cytochrome P450 1A1-catalyzed 7-ethoxyresonifin O-deethylase (EROD) activity in mammalian cell culture (EROD bioassay) is thought to be a selective and sensitive parameter used for the quantification of dioxinlike compounds. Fly ash extracts from municipal waste incinerators (MWI), a crematorium, wood combustors, and a noble metal recycling facility sere analyzed in the EROD bioassay using rat hepatocytes in primary culture. Fractions containing 2,3,7,8-substituted PCDDs/PCDFs, dioxinlike PCBs, and 16 major polycyclic aromatic hydrocarbons (PAHs) were isolated from the extract and analyzed by gas chromatography-mass spectrometry (GC-MS) and by the EROD bioassay. It was found that with MWI samples the bioassay of the extract resulted in a two-to five-fold higher estimate of TCDD equivalents (TEQ) than the chemical analysis of PCDDs/PCDFs and PCBs, However, the outcome of both methods was significantly correlated, making thr bioassay useful as a tough estimate for the sum of potent PCDDs/PCDFs and dioxinlike PCBs in extracts from MWI fly ash samples and in a fly ash sample from a crematorium. In noble metal recycling facility and wood combustor samples, higher amounts of PAHs were found. contributing to more pronounced differences between the results of both methods, The remaining unexplained inducing potency in ny ash samples probably results from additional dioxinlike components including certain PAHs not analyzed in this study. The hypothesis that emissions from MWI of hitherto unidentified dioxinlike compounds are higher by orders of magnitude than emissions of potent PCDDs/PCDFs and dioxinlike PCBs could not be confirmed. We found no indication for a marked synergistic interaction of dioxinlike fly ash components in the bioassay.

? Claudio, L., Torres, T., Sanjurjo, E., Sherman, L.R. and Landrigan, P.J. (1998), Environmental health sciences education: A tool for achieving environmental equity and protecting children. *Environmental Health Perspectives*, **106** (S3), 849-855.

Full Text: [1997\Env Hea Per106, 849.pdf](1997/Env%20Hea%20Per106,%20849.pdf)

Abstract: Children are highly susceptible to deleterious effects of environmental toxins. Those who live in underserved communities may be particularly at risk because environmental pollution has been found to be disproportionately distributed among communities. Mounting evidence suggests that asthma rates are rising and that this disease can be caused or aggravated by air pollution. Although ambient air quality has generally improved, these improvements have not reached minority communities in equal proportions. This and other data has fueled the concept of environmental justice or environmental equity, which has led to community activism and government actions. One possible example of environmental inequity and its consequences is the Hunt’s Point community, in the South Bronx, New York. This community experiences a high pollution burden with the siting of facilities that emit hazardous wastes into the air. Our approach to this problem has been the formation of mechanisms for bidirectional communication between community residents, government entities, and academic institutions such as Mount Sinai Medical Center. As a result of this experience, we believe that the key to achieving environmental health, especially in communities of color where many children are at risk, is to empower residents to take charge of their environment by providing relevant educational opportunities. Strategies for environmental health education include multitiered training approaches that include community residents, parent education, direct children education, and community education through professional counselors and train-the-trainer approaches. We propose that academic researchers must use community residents not just as subjects of our studies, but to increase our mutual understanding of environmental health, resulting in active participation of community members in research design, data collection, analysis, and dissemination of results in order to make intervention strategies more effective.

Keywords: Community Education, Minority Populations, Children’s Health, Environmental Health Sciences, Community Outreach, New-York-City, Air-Pollution, Bronchial Responsiveness, Respiratory Health, Pulmonary-Function, House-Dust, Asthma, Community, Exposure, Disease

Shimokura, G.H., Savitz, D.A. and Symanski, E. (1998), Assessment of water use for estimating exposure to tap water contaminants. *Environmental Health Perspectives*, **106** (2), 55-59.

Full Text: [1998\Env Hea Per106, 55.pdf](1998/Env%20Hea%20Per106,%2055.pdf)

Abstract: Epidemiological studies examining the association between exposure to tap water contaminants (such as chlorination by-products) and disease outcomes (such as cancer and adverse reproductive outcomes) have been limited by inaccurate exposure assessment. Failure to take into account the variation in beverage and tap water consumption and exposure to volatile contaminants through inhalation and dermal absorption can introduce misclassification in assessing the association between exposure to tap water contaminants and health. To refine exposure assessment of tap water contaminants, we describe in detail the tap water consumption, showering, and bathing habits of pregnant women and their male partners as assessed by a questionnaire and a 3-day water diary. We found good agreement between questionnaire and 3-day water diary values for drinking water intake (Pearson’s r = 0.78) and for time spent showering (r = 0.68) and bathing (r = 0.78). Half of the participants consumed tap water on a regular basis with an overall mean±1 standard deviation (SD) of 0. 78±0.51 l/day. Our results further suggest that full-time employees, compared to women working part-time or less, have more heterogeneous consumption patterns over time. Seventy-nine percent of women and 94% of men took showers for an average of 11.6±4.0 min and 10.4±4.8 min, respectively. Baths were taken more frequently by women than men (21% vs. 3%) for an average of 22.9±10.1 min and 21.3±12.4 min, respectively. Thus, these patterns of tap water use should be considered in the design and interpretation of environmental epidemiology studies.

? Weaver, V.M., Buckley, T.J. and Groopman, J.D. (1998), Approaches to environmental exposure assessment in children. *Environmental Health Perspectives*, **106** (3S), 827-832.

Full Text: [1998\Env Hea Per106, 827.pdf](1998/Env%20Hea%20Per106,%20827.pdf)

Abstract: An improved understanding of the contribution made by environmental exposures to disease burden in children is essential, given current increasing rates of childhood illnesses such asthma and cancer. Children must be routinely included in Environmental Research. Exposure assessment, both external (e.g., air, water) and internal dose (e.g., biomarkers), is an integral component of such research. Biomarker measurement has some advantages that are unique in children. These include assessment of potentially increased absorption because of behaviors that differ from adults (i.e., hand-to-mouth activity), metabolite measurement, which can help identify age-related susceptibility differences, and improved assessment of dermal exposure, an important exposure route in children. Environmental exposure assessment in children will require adaption of techniques that are currently applied in adult studies as well as development of tools and validation of strategies that are unique for children. Designs that focus on parent-child study units provide adult comparison data and allow the parent to assist with more complex study designs. Use of equipment that is sized appropriately for children, such as small air pumps and badge monitors, is also important. When biomarkers are used, biologic specimens that can be obtained noninvasively are preferable. Although the current need is primarily for small focused studies to address specific questions and optimize research tools, the future will require establishment of large prospective cohorts. Urban children are an important study cohort because of relatively high morbidity observed in the urban environment. Finally, examples of completed or possible future studies utilizing these techniques are discussed for specific exposures such as benzene, environmental tobacco smoke, aflatoxin, volatile organic compounds, and polycyclic aromatic hydrocarbons.

Taets, C., Aref, S. and Rayburn, A.L. (1998), The clastogenic potential of triazine herbicide combinations found in potable water supplies. *Environmental Health Perspectives*, **106** (4), 197-201.

Full Text: [1998\Env Hea Per106, 197.pdf](1998/Env%20Hea%20Per106,%20197.pdf)

Abstract: Pesticide contamination of drinking water supplies has increased over the past decade. A major concern is how exposure to combinations of low levels of pesticides, especially herbicides, could affect public health. Flow cytometric analysis was performed to determine the clastogenic potential of herbicide interaction on Chinese hamster ovary (CHO) cells. The cells were exposed to atrazine, simazine, cyanazine, and all possible combinations of these chemicals for 48 hr. Two concentrations were used for each sample: the U.S. EPA maximum contamination level (MCL) and the highest contamination level found in Illinois water supplies. Nuclei were isolated from the cells and analyzed by flow cytometry. The effects of clastogenicity were measured by the coefficient of variation (CV) of the G1 peak of whole cells and the change in CV of the largest chromosome in the flow karyotype. At both levels tested, atrazine caused chromosomal damage to the CHO cells. Simazine was observed to induce whole-cell clastogenicity but not flow karyotype damage. Cyanazine did not induce any measurable chromosomal damage in either analysis. Each of the herbicides, although all three were triazines, had different effects with respect to chromosome damage as measured by flow cytometry. CHO cells treated with a combination of atrazine and simazine, or atrazine and cyanazine, were observed to have whole-cell and flow karyotype damage. This damage was, however, equal to or less severe than the damage caused by either atrazine or simazine alone. No synergy was observed. When all three herbicides were combined, three of the four possible combinations gave no observable clastogenic response.

? Aschengrau, A., Paulu, C. and Ozonoff, D. (1998), Tetrachloroethylene-contaminated drinking water and the risk of breast cancer. *Environmental Health Perspectives*, **106** (4S), 947-953.

Full Text: [1998\Env Hea Per106, 947.pdf](1998/Env%20Hea%20Per106,%20947.pdf)

Abstract: We conducted a population-based case-control study to evaluate the relationship between cases of breast cancer and exposure to tetrachloroethylene (PCE) from public drinking water (n = 258 cases and 686 controls). Women were exposed to PCE when it leached from the vinyl lining of water distribution pipes. The relative delivered dose was estimated using an algorithm that accounted for residential history, water flow, and pipe characteristics. Only small increases in breast cancer risk were seen among ever-exposed women either when latency was ignored or when 5 to 15 years of latency was considered. No or small increases were seen among highly exposed women either when latency was ignored or when 5 years of latency was considered. However, the adjusted odds ratios (ORs) were more increased for highly exposed women when 7 and 9 years of latency, respectively, were considered (OR 1.5 95% CI 0.5-4.7 and OR 2.3, 95% CI 0.6-8.8 for the 75th percentile, and OR 2.7, 95% CI 0.4-15.8 and OR 7.6, 95% CI 0.9-161.3 for the 90th percentile). The number of highly exposed women was too small for meaningful analysis when more years of latency were considered. Because firm conclusions from these data are limited, we recently undertook a new study with a large number of more recently diagnosed cases.

? Johnson, P.D., Dawson, B.V. and Goldberg, S.J. (1998), A review: Trichloroethylene metabolites: Potential cardiac teratogens. *Environmental Health Perspectives*, **106** (4S), 995-999.

Full Text: [1998\Env Hea Per106, 995.pdf](1998/Env%20Hea%20Per106,%20995.pdf)

Abstract: This review is a a series of the authors’ studies designed to test the hypothesis that administration of trichloroethylene (TCE), dichloroethylene (DCE), their metabolites, and related compounds are responsible for fetal cardiac teratogenesis when given to pregnant rats during organogenesis. Identification of teratogenic compounds will allow more accurate assessment of environmental contaminants and public health risks. Epidemiologic studies and previous teratogenic studies using chick embryos and fetal rats have reported an increased number of congenital cardiac defects when exposed to TCE or DCE during fetal development. Metabolites of TCE and DCE studied in the drinking-water exposure study include trichloroacetic acid TCAA), monochloroacetic acid, trichloroethanol, carboxymethylcysteine, trichloroacetaldehyde, dichloroacetaldehyde, and dichlorovinyl cysteine. Varying doses of each were given in drinking water to pregnant rats during the period of fetal heart development. Rats receiving 2730 ppm TCAA in drinking water were the only metabolite group demonstrating a significant increase in the number of cardiac defects in fetuses on a per-litter basis (p = 0.0004 Wilcoxon test and p = 0.0015 exact permutation test). Maternal and fetal variables showed no statistically significant differences between treated and untreated groups. When treated with TCAA the increased cardiac defects, as compared to controls, do not preclude the involvement of other metabolites as cardiac teratogens, but indicates TCAA as a specific cardiac teratogen. Further studies of drinking-water exposure and potential mechanisms of action on the developing heart are proceeding.

Anderson, H.A., Falk, C., Hanrahan, L., Olson, J., Burse, V.W., Needham, L., Paschal, D., Patterson, Jr., D., Hill, Jr., R.H. and The Great Lakes Consortium (1998), Profiles of Great Lakes critical pollutants: A sentinel analysis of human blood and urine. The Great Lakes Consortium. *Environmental Health Perspectives*, **106** (5), 279-289.

Full Text: [1998\Env Hea Per106, 279.pdf](1998/Env%20Hea%20Per106,%20279.pdf)

Abstract: To determine the contaminants that should be studied further in the subsequent population-based study, a profile of Great Lakes (GL) sport fish contaminant residues were studied in human blood and urine specimens from 32 sport fish consumers from three Great Lakes: Lake Michigan (n = 10), Lake Huron (n = 11), and Lake Erie (n = 11). Serum was analyzed for 8 polychlorinated dioxin congeners, 10 polychlorinated furan congeners, 4 coplanar and 32 other polychlorinated biphenyl (PCB) congeners, and 11 persistent chlorinated pesticides. Whole blood was analyzed for mercury and lead. Urine samples were analyzed for 10 nonpersistent pesticides (or their metabolites) and 5 metals. One individual was excluded from statistical analysis because of an unusual exposure to selected analytes. Overall, the sample (n = 31) consumed, on average, 49 GL sport fish meals per year for a mean of 33 years. On average, the general population in the GL basin consume 6 meals of GL sport fish per year. The mean tissue levels of most persistent, bioaccumulative compounds also found in GL sport fish ranged from less than a twofold increase to that of PCB 126, which was eight times the selected background levels found in the general population. The overall mean total toxic equivalent for dioxins, furans, and coplanar PCBs were greater than selected background levels in the general population (dioxins, 1.8 times, furans, 2.4 times, and coplanar PCBs, 9.6 times). The nonpersistent pesticides and most metals were not identified in unusual concentrations. A contaminant pattern among lake subgroups was evident. Lake Erie sport fish consumers had consistently lower contaminant concentrations than consumers of sport fish from Lake Michigan and Huron. These interlake differences are consistent with contaminant patterns seen in sport fish tissue from the respective lakes, GL sport fish consumption was the most likely explanation for observed contaminant levels among this sample. Frequent consumers of sport fish proved to be effective sentinels for identifying sport fish contaminants of concern. In the larger study to follow, serum samples will be tested for PCBs (congener specific and coplanar), DDE, dioxin, and furans.

? Gardner, Jr., H.S., Brennan, L.M., Toussaint, M.W., Rosencrance, A.B., Boncavage Hennessey, E.M. and Wolfe, M.J. (1998), Environmental complex mixture toxicity assessment. *Environmental Health Perspectives*, **106** (6S), 1299-1305.

Full Text: [1998\Env Hea Per106, 1299.pdf](1998/Env%20Hea%20Per106,%201299.pdf)

Abstract: Trichloroethylene (TCE) was found as a contaminant in the well supplying water to an aquatic testing laboratory. The groundwater was routinely screened by a commercial laboratory for volatile and semivolatile compounds, metals, herbicides, pesticides, and polychlorinated biphenyls using U.S. Environmental Protection Agency methods. Although TCE was the only reportable peak on the gas chromatograph, with average concentrations of 0.200 mg/l, other small peaks were also present, indicating the possibility that the contamination was not limited to TCE alone. A chronic 6-month carcinogenicity assay was conducted on-site in a biomonitoring trailer, using the Japanese medaka fish (Oryzias latipes) in an initiation-promotion protocol, with diethylnitrosamine (DEN) as the initiator and the TCE-contaminated groundwater as a promoter. Study results indicated no evidence of carcinogenic potential of the groundwater without initiation. There was, however, a tumor-promotional effect of the groundwater after DEN initiation. A follow-up laboratory study was conducted using reagent grade TCE added to carbon-filtered groundwater to simulate TCE concentrations comparable to those found in the contaminated groundwater. Study results indicated no promotional effects of TCE. These studies emphasize the necessity for on-site bioassays to assess potential environmental hazards. In this instance, chemical analysis of the groundwater identified TCE as the only reportable contaminant, but other compounds present below reportable limits were noted and may have had a synergistic effect on tumor promotion observed with the groundwater exposure. Laboratory toxicity testing of single compounds can produce toxicity data specific to that compound for that species but cannot take into account the possible toxic effects of mixtures of compounds.

Ding, W.X., Shen, H.M., Shen, Y., Zhu, H.G. and Ong, C.N. (1998), Microcystic cyanobacteria causes mitochondrial membrane potential alteration and reactive oxygen species formation in primary cultured rat hepatocytes. *Environmental Health Perspectives*, **106** (7), 409-413.

Full Text: [1998\Env Hea Per106, 409.pdf](1998/Env%20Hea%20Per106,%20409.pdf)

Abstract: Cyanobacteria contamination of water has become a growing public health problem worldwide. Microcystis aeruginosa is one of the most common toxic cyanobacteria. It is capable of producing microcystins, a group of cyclic heptapeptide compounds with potent hepatotoxicity and tumor promotion activity. The present study investigated the effect of microcystic cyanobacteria on primary cultured rat hepatocytes by examining mitochondrial membrane potential (MMP) changes and intracellular reactive oxygen species (ROS) formation in cells treated with lyophilized freshwater microcystic cyanobacteria extract (MCE). Rhodamine 123 (Rh-123) was used as a fluorescent probe for changes in mitochondrial fluorescence intensity. The mitochondrial Rh-123 fluorescence intensity in MCE-treated hepatocytes, examined using a laser confocal microscope, responded in a dose-and time-dependent manner. The results thus indicate that the alteration of MMP might be an important event in the hepatotoxicity caused by cyanobacteria. Moreover, the parallel increase of ROS formation detected using another fluorescent probe, 2’, 7’-dichlorofluorescin diacetate also suggests the involvement of oxidative stress in the hepatotoxicity caused by cyanobacteria. The fact that MMP changes precede other cytotoxic parameters such as nuclear staining by propidium iodide and cell morphological changes suggests that mitochondrial damage is closely associated with MCE-induced cell injury in cultured rat hepatocytes.

Breslin, K. (1998), Safer sips: Removing arsenic from drinking water. *Environmental Health Perspectives*, **106** (11), A548-A550.

Full Text: [1998\Env Hea Per106, A548.pdf](1998/Env%20Hea%20Per106,%20A548.pdf)

Albering, H.J., Rila, J.P., Moonen, E.J., Hoogewerff, J.A. and Kleinjans, J.C. (1999), Human health risk assessment in relation to environmental pollution of two artificial freshwater lakes in The Netherlands. *Environmental Health Perspectives*, **107** (1), 27-35.

Full Text: [E\Env Hea Per107, 27.pdf](E/Env%20Hea%20Per107,%2027.pdf)

Abstract: A human health risk assessment has been performed in relation to recreational activities on two artificial freshwater lakes along the river Meuse in The Netherlands. Although the discharges of contaminants into the river Meuse have been reduced in the last decades, which is reflected in decreasing concentrations of pollutants in surface water and suspended matter, the levels in sediments are more persistent. Sediments of the two freshwater lakes appear highly polluted and may pose a health risk in relation to recreational activities. To quantify health risks for carcinogenic (e.g., polycyclic aromatic hydrocarbons) as well as noncarcinogenic compounds (e.g., heavy metals), an exposure assessment model was used. First, we used a standard model that solely uses data on sediment pollution as the input parameter, which is the standard procedure in sediment quality assessments in The Netherlands. The highest intake appeared to be associated with the consumption of contaminated fish and resulted in a health risk for Pb and Zn (hazard index exceeded 1). For the other heavy metals and for benzo(a)pyrene, the total averaged exposure levels were below levels of concern. Secondly, input data for a more location-specific calculation procedure were provided via analyses of samples from sediment, surface water, and suspended matter. When these data (concentrations in surface water) were taken into account, the risk due to consumption of contaminated fish decreased by more than two orders of magnitude and appeared to be negligible. In both exposure assessments, many assumptions were made that contribute to a major degree to the uncertainty of this risk assessment. However, this health risk evaluation is useful as a screening methodology for assessing the urgency of sediment remediation actions.

Albering, H.J., van Leusen, S.M., Moonen, E.J., Hoogewerff, J.A. and Kleinjans, J.C. (1999), Human health risk assessment: A case study involving heavy metal soil contamination after the flooding of the river Meuse during the winter of 1993-1994. *Environmental Health Perspectives*, **107** (1), 37-43.

Full Text: [E\Env Hea Per107, 37.pdf](E/Env%20Hea%20Per107,%2037.pdf)

Abstract: At the end of December 1993 and also at the end of January 1995, the river Meuse, one of the major rivers in Europe, flooded and river banks were inundated. We investigated the possible health risks of exposure to heavy metal concentrations in river bank soils resulting from the flooding of the river Meuse at the end of 1993. Soil and deposit samples and corresponding aerable and fodder crops were collected and analyzed for heavy metals. Although the soils of the floodplain of the river Meuse appeared severely polluted mainly by Cd and Zn, the heavy metal concentrations in the crops grown on these soils were within background ranges. Incidentally, the legal standard for Cd as endorsed by the Commodities Act was exceeded in wheat crops. The main exposure pathways for the general population were through the consumption of food crops grown on the river banks and through the direct ingestion of contaminated soils. For estimating potential human exposure in relation to soil pollution, we used a multiple pathway exposure model. For estimating the actual risk, we determined metal contents of vegetables grown in six experimental gardens. From this study, it can be concluded that there is a potential health risk for the river bank inhabitants as a consequence of Pb and Cd contaminations of the floodplain soils of the river Meuse, which are frequently inundated (averaged flooding frequency once every 2 years).

Carpenter, D.O., Cikrt, M. and Suk, W.A. (1999), Hazardous wastes in eastern and central Europe: Technology and health effects. *Environmental Health Perspectives*, **107** (4), 249-250.

Full Text: [E\Env Hea Per107, 249.pdf](E/Env%20Hea%20Per107,%20249.pdf)

Abstract: Issues of hazardous waste management are major concerns in the countries of eastern and central Europe. A National Institute of Environmental Health Sciences-supported conference was held in Prague, Czech Republic, as a part of a continuing effort to provide information and promote discussion among the countries of eastern and central Europe on issues related to hazardous wastes. The focus was on incineration as a means of disposal of hazardous wastes, with discussions on both engineering methods for safe incineration, and possible human health effects from incineration by-products. Representatives from government agencies, academic institutions, and local industries from 14 countries in the region participated along with a few U.S. and western European experts in this field. A series of 12 country reports documented national issues relating to the environment, with a focus on use of incineration for hazardous waste disposal. A particularly valuable contribution was made by junior scientists from the region, who described results of environmental issues in their countries.

Keywords: Arsenic, Cadmium, Dioxins, Human Health, Incineration, Lead, Metals, PCBs, Persistent Organic Pollutants, Pesticides

Wu, C., Maurer, C., Wang, Y., Xue, S. and Davis, D.L. (1999), Water pollution and human health in China. *Environmental Health Perspectives*, **107** (4), 251-256.

Full Text: [E\Env Hea Per107, 251.pdf](E/Env%20Hea%20Per107,%20251.pdf)

Abstract: China’s extraordinary economic growth, industrialization, and urbanization, coupled with inadequate investment in basic water supply and treatment infrastructure, have resulted in widespread water pollution. In China today approximately 700 million people-over half the population-consume drinking water contaminated with levels of animal and human excreta that exceed maximum permissible levels by as much as 86% in rural areas and 28% in urban areas. By the year 2000, the volume of wastewater produced could double from 1990 levels to almost 78 billion tons. These are alarming trends with potentially serious consequences for human health. This paper reviews and analyzes recent Chinese reports on public health and water resources to shed light on what recent trends imply for China’s environmental risk transition. This paper has two major conclusions. First, the critical deficits in basic water supply and sewage treatment infrastructure have increased the risk of exposure to infectious and parasitic disease and to a growing volume of industrial chemicals, heavy metals, and algal toxins. Second, the lack of coordination between environmental and public health objectives, a complex and fragmented system to manage water resources, and the general treatment of water as a common property resource mean that the water quality and quantity problems observed as well as the health threats identified are likely to become more acute.

Paulu, C., Aschengrau, A. and Ozonoff, D. (1999), Tetrachloroethylene-contaminated drinking water in Massachusetts and the risk of colon-rectum, lung, and other cancers. *Environmental Health Perspectives*, **107** (4), 265-271.

Full Text: [E\Env Hea Per107, 265.pdf](E/Env%20Hea%20Per107,%20265.pdf)

Abstract: We conducted a population-based case-control study to evaluate the relationship between cancer of the colon-rectum (n = 326), lung (n = 252), brain (n = 37), and pancreas (n = 37), and exposure to tetrachloroethylene (PCE) from public drinking water. Subjects were exposed to PCE when it leached from the vinyl lining of drinking-water distribution pipes. Relative delivered dose of PCE was estimated using a model that took into account residential location, years of residence, water flow, and pipe characteristics. Adjusted odds ratios (ORs) for lung cancer were moderately elevated among subjects whose exposure level was above the 90th percentile whether or not a latent period was assumed [ORs and 95% confidence intervals (CIs), 3.7 (1.0-11.7), 3.3 (0.6-13.4), 6.2 (1.1-31.6), and 19.3 (2.5-141.7) for 0, 5, 7, and 9 years of latency, respectively]. The adjusted ORs for colon-rectum cancer were modestly elevated among ever-exposed subjects as more years of latency were assumed [OR and CI, 1.7 (0.8-3.8) and 2.0 (0.6-5.8) for 11 and 13 years of latency, respectively]. These elevated ORs stemmed mainly from associations with rectal cancer. Adjusted ORs for rectal cancer among ever-exposed subjects were more elevated [OR and CI, 2.6 (0. 8-6.7) and 3.1 (0.7-10.9) for 11 and 13 years of latency, respectively] than were corresponding estimates for colon cancer [OR and CI, 1.3 (0.5-3.5) and 1.5 (0.3-5.8) for 11 and 13 years of latency, respectively]. These results provide evidence for an association between PCE-contaminated public drinking water and cancer of the lung and, possibly, cancer of the colon-rectum.

? Daughton, C.G. and Ternes, T.A. (1999), Pharmaceuticals and personal care products in the environment: Agents of subtle change? *Environmental Health Perspectives*, **107** (S6), 907-938.

Full Text: [1999\Env Hea Per107, 907.pdf](1999/Env%20Hea%20Per107,%20907.pdf)

Abstract: During the last three decades, the impact of chemical pollution has focused almost exclusively on the conventional “priority” pollutants, especially those acutely toxic/carcinogenic pesticides and industrial intermediates displaying persistence in the environment. This spectrum of chemicals, however, is only one piece of the larger puzzle in “holistic” risk assessment. Another diverse group of bioactive chemicals receiving comparatively little attention as potential environmental pollutants includes the pharmaceuticals and active ingredients in personal care products (in this review collectively termed PPCPs), both human and veterinary, including not just prescription drugs and biologics, but also diagnostic agents, “nutraceuticals,” fragrances, sun-screen agents, and numerous others. These compounds and their bioactive metabolites can be continually introduced to the aquatic environment as complex mixtures via a number of routes but primarily by both untreated and treated sewage. Aquatic pollution is particularly troublesome because aquatic organisms are captive to continual life-cycle, multigenerational exposure. The possibility for continual but undetectable or unnoticed effects on aquatic organisms is particularly worrisome because effects could accumulate so slowly that major change goes undetected until the cumulative level of these effects finally cascades to irreversible change-change that would otherwise be attributed to natural adaptation or ecologic succession. As opposed to the conventional, persistent priority pollutants, PPCPs need not be persistent if they are continually introduced to surface waters, even at low parts-per-trillion/parts-per-billion concentrations (ng-microg/L). Even though some PPCPs are extremely persistent and introduced to the environment in very high quantities and perhaps have already gained ubiquity worldwide, others could act as if they were persistent, simply because their continual infusion into the aquatic environment serves to sustain perpetual life-cycle exposures for aquatic organisms. This review attempts to synthesize the literature on environmental origin, distribution/occurrence, and effects and to catalyze a more focused discussion in the environmental science community.

Keywords: Aquatic, Drugs, Ecologic Health, Ecologic Risk Assessment, Emerging Risk, Pharmaceuticals, Pollution, Sewage, Multixenobiotic Resistance Mechanism, Fluoroquinolone Carboxylic-Acids, Chromatography Mass-Spectrometry, Serotonin Reuptake Inhibitors, Polycyclic Musk Fragrances, Red Swamp Crayfish, Fresh-Water Fish, In-Vivo, Organic Contaminants, Aquatic Environment

Downs, T.J., Cifuentes-García, E. and Suffet, I.M. (1999), Risk screening for exposure to groundwater pollution in a wastewater irrigation district of the Mexico City region. *Environmental Health Perspectives*, **107** (7), 553-561.

Full Text: [E\Env Hea Per107, 553.pdf](E/Env%20Hea%20Per107,%20553.pdf)

Abstract: Untreated wastewater from the Mexico City basin has been used for decades to irrigate cropland in the Mezquital Valley, State of Hidalgo, Mexico. Excess irrigation water recharges the near-surface aquifer that is used as a domestic water supply source. We assessed the groundwater quality of three key groundwater sources of domestic water by analyzing for 24 trace metals, 67 target base/neutral/acid (BNA) organic compounds, nontarget BNA organics, 23 chlorinated pesticides, 20 polychlorinated biphenyls, and nitrate, as well as microbiological contaminants-coliforms, *Vibrio cholerae*, and Salmonella. Study participants answered a questionnaire that estimated ingestion and dermal exposure to groundwater, 10% of the sample reported frequent diarrhea and 9% reported persistent skin irritations. Detection of *V. cholerae* non-01 in surface waters at all sites suggested a potential risk (surrogate indicator present) of diarrheal disease for canal and river bathers by accidental ingestion, as well as potential Vibrio contamination of near-surface groundwater and potential cholera risk, magnified by lapses in disinfection. High total coliform levels in surface water and lower levels in groundwater at all sites indicated fecal contamination and a potential risk of gastrointestinal disease in populations exposed to inadequately disinfected groundwater. Using chemical criteria, no significant risk from ingestion or dermal contact was identified at the method detection limits at any site, except from nitrate exposure: infants and young children are at risk from methemoglobinemia at all sites. Results suggest that pathogen risk interventions are a priority, whereas nitrate risk needs further characterization to determine if formal treatment is needed. The risks exist inside and outside the irrigation district. The method was highly cost-effective.

Abernathy, C.O., Liu, Y.P., Longfellow, D., Aposhian, H.V., Beck, B., Fowler, B., Goyer, R., Menzer, R., Rossman, T., Thompson, C. and Waalkes, M. (1999), Arsenic: Health effects, mechanisms of actions, and research issues. *Environmental Health Perspectives*, **107** (7), 593-597.

Full Text: [E\Env Hea Per107, 593.pdf](E/Env%20Hea%20Per107,%20593.pdf)

Abstract: A meeting on the health effects of arsenic (As), its modes of action, and areas in need of future research was held in Hunt Valley, Maryland, on 22-24 September 1997. Exposure to As in drinking water has been associated with the development of skin and internal cancers and noncarcinogenic effects such as diabetes, peripheral neuropathy, and cardiovascular diseases. There is little data on specific mechanism(s) of action for As, but a great deal of information on possible modes of action. Although arsenite [As(III)] can inhibit more than 200 enzymes, events underlying the induction of the noncarcinogenic effects of As are not understood. With respect to carcinogenicity, As can affect DNA repair, methylation of DNA, and increase radical formation and activation of the protooncogene c-myc, but none of these potential pathways have widespread acceptance as the principal etiologic event. In addition, there are no accepted models for the study of As-induced carcinogenesis. At the final meeting session we considered research needs. Among the most important areas cited were a) As metabolism and its interaction with cellular constituents, b) possible bioaccumulation of As, c) interactions with other metals, d) effects of As on genetic material, e) development of animal models and cell systems to study effects of As, and f) a better characterization of human exposures as related to health risks. Some of the barriers to the advancement of As research included an apparent lack of interest in the United States on As research, lack of relevant animal models, difficulty with adoption of uniform methodologies, lack of accepted biomarkers, and the need for a central storage repository for stored specimens.

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Full Text: [E\Env Hea Per107, A404.pdf](E/Env%20Hea%20Per107,%20A404.pdf)

Abstract: The U.S. per-capita figure for garbage production has topped four pounds per person per day, and that amount is rising at roughly 5% per year. In the past, municipal solid waste was sent to the nearest local landfill or incinerator. But in 1988, the U.S. Environmental Protection Agency instituted the first federal standards for landfills, designed to make them safer. Over 10,000 small municipal landfills have since been consolidated into an estimated 3,500 newer, safer landfills, some of which are “megafills” that can handle up to 10,000 tons of waste a day. The new landfills are outfitted to prevent air and water pollution and limit the spread of disease by scavengers. Although the new landfills provide better controls against air and water pollution as well as an alternate source of municipal income, they are not entirely problem-free. Some experts believe the new landfill technology has not been properly tested and will therefore not provide protection in the long run. Others feel that poorer, less well-informed communities are targeted as sites for new landfills. In addition, many people that live near megafills, which may draw garbarge from several states, are unhappy about the noise, truck traffic, odors, and pests caused by the facilities.

Çöl, M., Çöl, C., Soran, A., Sayli, B.S. and Öztürk, S. (1999), Arsenic-related Bowen’s disease, palmar keratosis, and skin cancer [clinical conference]. *Environmental Health Perspectives*, **107** (8), 687-689.

Full Text: [E\Env Hea Per107, 687.pdf](E/Env%20Hea%20Per107,%20687.pdf)

Abstract: Chronic arsenical intoxication can still be found in environmental and industrial settings. Symptoms of chronic arsenic intoxication include general pigmentation or focal “raindrop” pigmentation of the skin and the appearance of hyperkeratosis of the palms of the hands and soles of the feet. In addition to arsenic-related skin diseases including keratosis, Bowen’s disease, basal-cell-carcinoma, and squamous-cell carcinoma, there is also an increased risk of some internal malignancies. Arsenic-related diseases are common in areas of the world where the drinking water has a high arsenic content. In this paper, we describe a 35-year-old male patient who had arsenic-related keratosis, squamous-cell carcinoma in the palmar area of his left hand, and Bowen’s disease on his left thigh. The patient worked in a borax mine for 15 years, so he was exposed to arsenic in drinking water, airborne arsenic in his workplace, and had direct contact. The patient was treated for 11 months for arsenic-related keratosis until an axillary lymph node metastasis occurred, the lesion was excised and diagnosed to be malignant. Bowen’s disease was detected when the patient was being treated for cancer. No other malignancy was found. The patient is still receiving regular follow-up care.

Kurttio, P., Pukkala, E., Kahelin, H., Auvinen, A. and Pekkanen, J. (1999), Arsenic concentrations in well water and risk of bladder and kidney cancer in Finland. *Environmental Health Perspectives*, **107** (9), 705-710.

Full Text: [E\Env Hea Per107, 705.pdf](E/Env%20Hea%20Per107,%20705.pdf)

Abstract: We assessed the levels of arsenic in drilled wells in Finland and studied the association of arsenic exposure with the risk of bladder and kidney cancers. The study persons were selected from a register-based cohort of all Finns who had lived at an address outside the municipal drinking-water system during 1967-1980 (n = 144, 627). The final study population consisted of 61 bladder cancer cases and 49 kidney cancer cases diagnosed between 1981 and 1995, as well as an age-and sex-balanced random sample of 275 subjects (reference cohort). Water samples were obtained from the wells used by the study population at least during 1967-1980. The total arsenic concentrations in the wells of the reference cohort were low (median = 0.1 microg/L, maximum = 64 microg/L), and 1% exceeded 10 microg/L. Arsenic exposure was estimated as arsenic concentration in the well, daily dose, and cumulative dose of arsenic. None of the exposure indicators was statistically significantly associated with the risk of kidney cancer. Bladder cancer tended to be associated with arsenic concentration and daily dose during the third to ninth years prior to the cancer diagnosis, the risk ratios for arsenic concentration categories 0.1-0.5 and [Greater/equal to] 0.5 microg/L relative to the category with < 0.1 microg/L were 1.53 [95% confidence interval (CI), 0.75-3.09] and 2.44 (CI, 1.11-5.37), respectively. In spite of very low exposure levels, we found some evidence of an association between arsenic and bladder cancer risk. More studies are needed to confirm the possible association between arsenic and bladder cancer risk at such low exposure levels.

Tondel, M., Rahman, M., Magnuson, A., Chowdhury, I.A., Faruquee, M.H. and Ahmad, S.A. (1999), The relationship of arsenic levels in drinking water and the prevalence rate of skin lesions in Bangladesh. *Environmental Health Perspectives*, **107** (9), 727-729.

Full Text: [E\Env Hea Per107, 727.pdf](E/Env%20Hea%20Per107,%20727.pdf)

Abstract: To determine the relationship of arsenic-associated skin lesions and degree of arsenic exposure, a cross-sectional study was conducted in Bangladesh, where a large part of the population is exposed through drinking water. Four villages in Bangladesh were identified as mainly dependent on wells contaminated with arsenic. We interviewed and examined 1, 481 subjects greater than or equal to 30 years of age in these villages. A total of 430 subjects had skin lesions (keratosis, hyperpigmentation, or hypopigmentation). Individual exposure assessment could only be estimated by present levels and in terms of a dose index, i.e., arsenic levels divided by individual body weight. Arsenic water concentrations ranged from 10 to 2, 040 µg/L, and the crude overall prevalence rate for skin lesions was 29/100. After age adjustment to the world population the prevalence rare was 30.1/100 and 26.5/100 for males and females, respectively. There was a significant trend for the prevalence rate both in relation to exposure levels and to dose index (p < 0.05), regardless of sex. This study shows a higher prevalence rate of arsenic skin lesions in males than females, with clear dose-response relationship. The overall high prevalence rate in the studied villages is an alarming sign of arsenic exposure and requires an urgent remedy.

Burkhart, J.G., Ankley, G., Bell, H., Carpenter, H., Fort, D., Gardiner, D. Gardner, H., Hale, R., Helgen, J.C., Jepson, P., Johnson, D., Lannoo, M., Lee, D., Lary, J., Levey, R., Magner, J., Meteyer, C., Shelby, M.D. and Lucier, G. (2000), Strategies for assessing the implications of malformed frogs for environmental health. *Environmental Health Perspectives*, **108** (1), 83-90.

Full Text: [E\Env Hea Per108, 83.pdf](E/Env%20Hea%20Per108,%2083.pdf)

Abstract: The recent increase in the incidence of deformities among natural frog populations has raised concern about the state of the environment and the possible impact of unidentified causative agents on the health of wildlife and human populations. An open workshop on Strategies for Assessing the Implications of Malformed Frogs for Environmental Health was convened on 4-5 December 1997 at the National Institute of Environmental Health Sciences in Research Triangle Park, North Carolina. The purpose of the workshop was to share information among a multidisciplinary group with scientific interest and responsibility for human and environmental health at the federal and state level. Discussions highlighted possible causes and recent findings directly related to frog deformities and provided insight into problems and strategies applicable to continuing investigation in several areas. Possible causes of the deformities were evaluated in terms of diagnostics performed on field amphibians, biologic mechanisms that can lead to the types of malformations observed, and parallel laboratory and field studies. Hydrogeochemistry must be more integrated into environmental toxicology because of the pivotal role of the aquatic environment and the importance of fates and transport relative to any potential exposure. There is no indication of whether there may be a human health factor associated with the deformities. However, the possibility that causal agents may be waterborne indicates a need to identify the relevant factors and establish the relationship between environmental and human health in terms of hazard assessment.

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Full Text: [2000\Env Hea Per108, 101.pdf](2000/Env%20Hea%20Per108,%20101.pdf)

Abstract: This review evaluates current epidemiologic literature on health effects in relation to residence near landfill sites. Increases in risk of adverse health effects (low birth weight, birth defects, certain types of cancers) have been reported near individual landfill sites and in some multisite studies, and although biases and confounding factors cannot be excluded as explanations for these findings, they may indicate real risks associated with residence near certain landfill sites. A general weakness in the reviewed studies is the lack of direct exposure measurement. An increased prevalence of self-reported health symptoms such as fatigue, sleepiness, and headaches among residents near waste sites has consistently been reported in more than 10 of the reviewed papers. It is difficult to conclude whether these symptoms are an effect of direct toxicologic action of chemicals present in waste sites, an effect of stress and fears related to the waste site, or an effect of reporting bias. Although a substantial number of studies have been conducted, risks to health from landfill sites are hard to quantify. There is insufficient exposure information and effects of low-level environmental exposure in the general population are by their nature difficult to establish. More interdisciplinary research can improve levels of knowledge on risks to human health of waste disposal in landfill sites. Research needs include epidemiologic and toxicologic studies on individual chemicals and chemical mixtures, well-designed single-and multisite landfill studies, development of biomarkers, and research on risk perception and sociologic determinants of ill health.

Keywords: Low-Birth-Weight, Adverse Pregnancy Outcomes, Santa-Clara-County, Contaminated Drinking-Water, Congenital-Malformations, Disposal Site, Environmental-Pollutants, Chemical-Mixtures, Ecological Health, Risk Assessment, Epidemiology, Hazardous Waste, Health Effects, Landfill, Residence, Review

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Wing, S., Cole, D. and Grant, G. (2000), Environmental injustice in North Carolina’s hog industry. *Environmental Health Perspectives*, **108** (3), 225-231.

Full Text: [E\Env Hea Per108, 225.pdf](E/Env%20Hea%20Per108,%20225.pdf)

Abstract: Rapid growth and the concentration of hog production in North Carolina have raised concerns of a disproportionate impact of pollution and offensive odors on poor and nonwhite communities. We analyzed the location and characteristics of 2, 514 intensive hog operations in relation to racial, economic, and water source characteristics of census block groups, neighborhoods with an average of approximately 500 households each. We used Poisson regression to evaluate the extent to which relationships between environmental justice variables and the number of hog operations persisted after consideration of population density. There are 18.9 times as many hog operations in the highest quintile of poverty as compared to the lowest, however, adjustment for population density reduces the excess to 7.2. Hog operations are approximately 5 times as common in the highest three quintiles of the percentage nonwhite population as compared to the lowest, adjusted for population density. The excess of hog operations is greatest in areas with both high poverty and high percentage nonwhites. Operations run by corporate integrators are more concentrated in poor and nonwhite areas than are operations run by independent growers. Most hog operations, which use waste pits that can contaminate groundwater, are located in areas with high dependence on well water for drinking. Disproportionate impacts of intensive hog production on people of color and on the poor may impede improvements in economic and environmental conditions that are needed to address public health in areas which have high disease rates and low access to medical care as compared to other areas of the state.

Keywords: Swine Confinement Buildings, Lung-Function, Human Health, Workers, Exposures, Inflammation, Endotoxin, Justice, Hazards, African Americans, Environmental Heath, Environmental Justice, Epidemiology, Geographic Information Systems, Rural Health

Havelaar, A.H., de Hollander, A.E.M., Teunis, P.F.M., Evers, E.G., van Kranen, H.J., Versteegh, J.F.M., van Koten, J.E.M. and Slob, W. (2000), Balancing the risks and benefits of drinking water disinfection: Disability adjusted life-years on the scale. *Environmental Health Perspectives*, **108** (4), 315-321.

Full Text: [E\Env Hea Per108, 315.pdf](E/Env%20Hea%20Per108,%20315.pdf)

Abstract: To evaluate the applicability of disability adjusted life-years (DALYs) as a measure to compare positive and negative health effects of drinking water disinfection, we conducted a case study involving a hypothetical drinking water supply from surface water. This drinking water supply is typical in The Netherlands. We compared the reduction of the risk of infection with *Cryptosporidium parvum* by ozonation of water to the concomitant increase in risk of renal cell cancer arising from the production of bromate. We applied clinical, epidemiologic, and toxicologic data on morbidity and mortality to calculate the net health benefit in DALYs. We estimated the median risk of infection with *C. parvum* as 10-3/person-year. Ozonation reduces the median risk in the baseline approximately 7-fold, but bromate is produced in a concentration above current guideline levels. However, the health benefits of preventing gastroenteritis in the general population and premature death in patients with acquired immunodeficiency syndrome outweigh health losses by premature death from renal cell cancer by a factor of > 10. The net benefit is approximately 1 DALY/million person-years. The application of DALYs in principle allows us to more explicitly compare the public health risks and benefits of different management options. In practice, the application of DALYs may be hampered by the substantial degree of uncertainty, as is typical for risk assessment.

Keywords: Potassium Bromate, *Cryptosporidium* Infection, Massive Outbreak, Carcinogenicity, Milwaukee, Inactivation, Wisconsin, Survival, Parvum, Rats, Bromate, *Cryptosporidium parvum*, Disinfection, Drinking Water, Ozone, Quality of Life, Risk Assessment

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Full Text: [E\Env Hea Per108, A225.pdf](E/Env%20Hea%20Per108,%20A225.pdf)

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Full Text: [E\Env Hea Per108, 655.pdf](E/Env%20Hea%20Per108,%20655.pdf)

Abstract: The U.S. Environmental Protection Agency is under a congressional mandate to revise its current standard for arsenic in drinking water. We present a risk assessment for cancers of the bladder, liver, and lung from exposure to arsenic in water, based on data from 42 villages in an arseniasis-endemic region of Taiwan. We calculate excess lifetime risk estimates for several variations of the generalized linear model and for the multistage-Weibull model. Risk estimates are sensitive to the model choice, to whether or not a comparison population is used to define the unexposed disease mortality rates, and to whether the comparison population is all of Taiwan or just the southwestern region. Some factors that may affect risk could not be evaluated quantitatively: the ecologic nature of the data, the nutritional status of the study population, and the dietary intake of arsenic. Despite all of these sources of uncertainty, however, our analysis suggests that the current standard of 50 µg/L is associated with a substantial increased risk of cancer and is not sufficiently protective of public health.

Keywords: Bladder Cancer, Generalized Linear Model, Lifetime Death Risk, Lung Cancer, Margin of Exposure, Multistage-Weibull, Well Water, Mortality, Bladder, Lung

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Full Text: [2000\Env Hea Per108, 675.pdf](2000/Env%20Hea%20Per108,%20675.pdf)

Abstract: The use of nitrate-contaminated drinking water to prepare infant formula is a well-known risk factor for infant methemoglobinemia. Affected infants develop a peculiar blue-gray skin color and may become irritable or lethargic, depending on the severity of their condition. The condition can progress rapidly to cause coma and death if it is not recognized and treated appropriately. Two cases of blue baby syndrome were recently investigated. Both cases involved infants who became ill after being fed formula that was reconstituted with water from private wells. Water samples collected from these wells during the infants’ illnesses contained nitrate-nitrogen concentrations of 22.9 and 27.4 mg/L.

Keywords: Blue Baby Syndrome, Methemoglobinemia, Nitrate, Nitrate-Contaminated Well Water, Drinking-Water, Infantile Methemoglobinemia, Ecological Analysis, Cancer Mortality, Nitric-Oxide, Risk, Yorkshire, Children, England

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Full Text: [E\Env Hea Per108, 731.pdf](E/Env%20Hea%20Per108,%20731.pdf)

Abstract: Arsenic, cadmium, and lead have been associated with various forms of cancer, nephrotoxicity, central nervous system effects, and cardiovascular disease in humans. Drinking water is a well-recognized pathway of exposure to these metals. To improve understanding of the temporal dimension of exposure to As, Cd, and Pb in drinking water, we obtained 381 samples of cap and/or tap/filtered water and self-reported rates of drinking water consumption from 73 members of a stratified random sample in Maryland. Data were collected at approximately 2-month intervals from September 1995 through September 1996. Concentrations of As (range < 0.2-13.8 µg/L) and Pb (< 0.1-13.4 µg/L) were within the ranges reported for the United Stares, as were the rates of drinking water consumption (median < 0.1-4.1 L/day). Cd was present at a detectable level in only 8.1% of the water samples. Mean log-transformed concentrations and exposures for As and Pb varied significantly among sampling cycles and among respondents, as did rates of drinking water consumption, according to a generalized linear model that accounted for potential correlation among repeated measures from the same respondent. We used the intraclass correlation coefficient of reliability to attribute the total variance observed for each exposure metric to between-person and within-person variability. Between-person variability was estimated to account for 67, 81, and 55% of the total variance in drinking water consumption, As exposure (micrograms per day), and Pb exposure (micrograms per day), respectively. We discuss these results with respect to their implications for future exposure assessment research, quantitative risk assessment, and environmental epidemiology.

Keywords: Arsenic, Cadmium, Chronic Exposure, Drinking Water, Lead, Short-Term Measurements, Population, Copper, Bias

Yang, C.Y., Cheng, B.H., Tsai, S.S., Wu, T.N., Lin, M.C. and Lin, K.C. (2000), Association between chlorination of drinking water and adverse pregnancy outcome in Taiwan. *Environmental Health Perspectives*, **108** (8), 765-768.

Full Text: [E\Env Hea Per108, 765.pdf](E/Env%20Hea%20Per108,%20765.pdf)

Abstract: Chlorination has been the major means of disinfecting drinking water in Taiwan. The use of chlorinated water has been hypothesized to lead to several adverse birth outcomes, including low birth weight and preterm delivery. We performed a study to examine the relationship between the use of chlorinated water and adverse birth outcomes in Taiwan. The study areas included 14 chlorinating municipalities (CHMs), which were defined as municipalities in which > 90% of the municipal population was served by chlorinated water, and 14 matched nonchlorinating municipalities (NCHMs), defined as municipalities in which < 5% of the municipal population is served by chlorinated water. The CHMs and NCHMs were similar to one another in terms of level of urbanization and sociodemographic characteristics. The study population comprised 18, 025 women residing in the 28 municipalities who had a first parity singleton birth between 1 January 1994 and 31 December 1996 and for which complete information on maternal age, education, gestational age, birth weight, and sex of the baby were available. The results of our study suggest chat there was no association between consumption of chlorinated drinking water and the risk of low birth weight.

Keywords: Chlorination, Disinfection By-Products, Drinking Water, Infants, Low Birth Weight, Congenital Cardiac Anomalies, Low-Birth-Weight, By-Products, Residential-Mobility, Cancer Mortality, Gestational-Age, Bladder-Cancer, Trihalomethanes, Exposure, Smoking

Pip, E. (2000), Survey of bottled drinking water available in Manitoba, Canada. *Environmental Health Perspectives*, **108** (9), 863-866.

Full Text: [E\Env Hea Per108, 863.pdf](E/Env%20Hea%20Per108,%20863.pdf)

Abstract: Forty domestic and imported brands of bottled water were purchased in Manitoba, Canada and examined for total dissolved solids (TDS), chloride, sulfate, nitrate-nitrogen, cadmium, lead, copper, and radioactivity. The samples showed great variation in quality, and some exceeded the Canadian Water Quality Guidelines for drinking water for TDS, chloride, and Lead. Carbonation, ozonation, and type of packaging were not associated with differences in metal levels, although carbonated samples tended to show higher TDS values. A number of deficiencies were found with respect to product labeling.

Keywords: Bottled Water, Cadmium, Chloride, Copper, Lead, Nitrate, Radioactivity, Sulfate, Total Dissolved Solids, Nitrate, Health, Sold, Lead

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Full Text: [E\Env Hea Per109, A116.pdf](E/Env%20Hea%20Per109,%20A116.pdf)

Abstract: Reports on the launch of a joint research program on the human and environmental health effects from spraying Agent Orange and other herbicides during the Vietnam War. Assessment of the extent of Agent Orange exposure among the Vietnamese, Identification of highly contaminated areas and monitoring migration of dioxin through the environment.

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Full Text: [2004\Env Hea Per112, 1099.pdf](2004/Env%20Hea%20Per112,%201099.pdf)

Abstract: Cadmium is a cumulative nephrotoxicant that is absorbed into the body from dietary sources and cigarette smoking. The levels of Cd in organs such as liver and kidney cortex increase with age because of the lack of an active biochemical process for its elimination coupled with renal reabsorption. Recent research has provided evidence linking Cd-related kidney dysfunction and decreases in bone mineral density in nonoccupationally exposed populations who showed no signs of nutritional deficiency. This challenges the previous view that the concurrent kidney and bone damage seen in Japanese itai-itai disease patients was the result of Cd toxicity in combination with nutritional deficiencies, notably, of zinc and calcium. Further, such Cd-linked bone and kidney toxicities were observed in people whose dietary Cd intakes were well within the provisional tolerable weekly intake (PTWI) set by the Joint Food and Agriculture Organization/World Health Organization Expert Committee on Food Additives of 1 mug/kg body weight/day or 70 mug/day. This evidence points to the much-needed revision of the current PTWI for Cd. Also, evidence for the carcinogenic risk of chronic Cd exposure is accumulating and Cd effects on reproductive outcomes have begun to emerge.

Keywords: Prostate Epithelial-Cells; Environmental Cadmium; Renal Dysfunction; General-Population; Occupational Exposure; Bone-Density; Body Burden; Vitamin-D; Kidney; Cancer

Notes: highly cited

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Full Text: [2004\Env Hea Per112, 1329.pdf](2004/Env%20Hea%20Per112,%201329.pdf)

Abstract: Exposure to arsenic has long been known to have neurologic consequences in adults, but to date there are no well-controlled studies in children. We report results of a cross-sectional investigation of intellectual function in 201 children 10 years of age whose parents participate in our ongoing prospective cohort study examining health effects of As exposure in 12,000 residents of Araihazar, Bangladesh. Water As and manganese concentrations of tube wells at each child’s home were obtained by surveying all wells in the study region. Children and mothers came to our field clinic, where children received a medical examination in which weight, height, and head circumference were measured. Children’s intellectual function on tests drawn from the Wechsler Intelligence Scale for Children, version III, was assessed by summing weighted items across domains to create Verbal, Performance, and Full-Scale raw scores. Children provided urine specimens for measuring urinary As and creatinine and were asked to provide blood samples for measuring blood lead and hemoglobin concentrations. Exposure to As from drinking water was associated with reduced intellectual function after adjustment for sociodemographic covariates and water Mn. Water As was associated with reduced intellectual function, in a dose-response manner, such that children with water As levels >50 μg/L achieved significantly lower Performance and Full-Scale scores than did children with water As levels <5.5 mug/L. The association was generally stronger for well-water As than for urinary As.

Keywords: Drinking-Water, Methylation, Metabolism, Urine, Lead

Notes: highly cited

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Full Text: [2005\Env Hea Per113, 894.pdf](2005/Env%20Hea%20Per113,%20894.pdf)

Abstract: Lead is a confirmed neurotoxin, but questions remain about lead-associated intellectual deficits at blood lead levels < 10 pg/dL and whether lower exposures are, for a given change in exposure, associated with greater deficits. The objective of this study was to examine the association of intelligence test scores and blood lead concentration, especially for children who had maximal measured blood lead levels < 10 mu g/dL. We examined data collected from 1,333 children who participated in seven international population-based longitudinal cohort studies, followed from birth or infancy until 5-10 years of age. The full-scale IQ score was the primary outcome measure. The geometric mean blood lead concentration of the children peaked at 17.8 mu g/dL and declined to 9.4 mu g/dL by 5-7 years of age; 244 (18%) children had a maximal blood lead concentration < 10 mu g/dL, and 103 (8%) had a maximal blood lead concentration < 7.5 pg/dL. After adjustment for covariates, we found an inverse relationship between blood lead concentration and IQ score. Using a log-linear model, we found a 6.9 IQ point decrement [95% confidence interval (CI), 4.2-9.4] associated with an increase in concurrent blood lead levels from 2.4 to 30 mu g/dL. The estimated IQ point decrements associated with an increase in blood lead from 2.4 to 10 pg/dL, 10 to 20 pg/dL, and 20 to 30 pg/dL were 3.9 (95% Cl, 2.4-5-3), 1.9 (95% Cl, 1.2-2.6), and 1.1 (95% Cl, 0.7-1.5), respectively. For a given increase in blood lead, the lead-associated intellectual decrement for children with a maximal blood lead level < 7.5 pg/dL was significantly greater than that observed for those with a maximal blood lead level >= 7.5 pg/dL (p = 0.015). We conclude that environmental lead exposure in children who have maximal blood lead levels < 7.5 Pg/dL is associated with intellectual deficits.

Keywords: Blood Lead Concentration, Children, Environment, Epidemiology, Intelligence, Lead, Lead Toxicity, Blood Lead, School Entry, Intelligence, Impairment, Attainment, Prevention, Childhood, Mechanisms, Cohort, IQ

? Wasserman, G.A., Liu, X.H., Parvez, F., Ahsan, H., Levy, D., Factor-Litvak, P., Kline, J., van Geen, A., Slavkovich, V., Lolacono, N.J., Cheng, Z.Q., Zheng, Y. and Graziano, J.H. (2006), Water manganese exposure and children’s intellectual function in Araihazar, Bangladesh. *Environmental Health Perspectives*, **114** (1), 124-129.

Full Text: [2006\Env Hea Per114, 124.pdf](2006/Env%20Hea%20Per114,%20124.pdf)

Abstract: Exposure to manganese via inhalation has long been known to elicit neurotoxicity in adults, but little is known about possible consequences of exposure via drinking water. In this study, we report results of a cross-sectional investigation of intellectual function in 142 10-year-old children in Araihaza, Bangladesh, who had been consuming tube-well water with an average concentration of 793 μg Mn/L and 3 μg arsenic/L. Children and mothers came to our field clinic, where children received a medical examination in which weight, height, and head circumference were measured. Children’s intellectual function was assessed on tests drawn from the Wechsler Intelligence Scale for Children, version III, by summing weighted items across domains to create Verbal, Performance, and Full-Scale raw scores. Children provided urine specimens for measuring urinary As and creatinine and were asked to provide blood samples for measuring blood lead, As, Mn, and hemoglobin concentrations. After adjustment for sociodemographic covariates, water Mn was associated with reduced Full-Scale, Performance, and Verbal raw scores, in a dose-response fashion; the low level of As in water had no effect. In the United States, roughly 6% of domestic household wells have Mn concentrations that exceed 300 mu g Mn/L, the current U.S. Environmental Protection Agency, lifetime health advisory level. We conclude that in both Bangladesh and the United States, some children are at risk for Mn-induced neurotoxicity.

Keywords: Children, IQ, Manganese, Absorption, Women

? Quandt, S.A., Hernández-Valero, M.A., Grzywacz, J.G., Hovey, J.D., Gonzales, M. and Arcury, T.A. (2006), Workplace, household, and personal predictors of pesticide exposure for farmworkers. *Environmental Health Perspectives*, **114** (6), 943-952.

Full Text: [2006\Env Hea Per114, 943.pdf](2006/Env%20Hea%20Per114,%20943.pdf)

Abstract: In this article we identify factors potentially associated with pesticide exposure among farmworkers, grade the evidence in the peer-reviewed literature for such associations, and propose a minimum set of measures necessary to understand farmworker risk for pesticide exposure. Data sources we reviewed included Medline, Science Citation index, Social Science Citation index, PsycINFO, and AGRICOLA databases. Data extraction was restricted to those articles that reported primary data collection and analysis published in 1990 or later. We read and summarized evidence for pesticide exposure associations. For data synthesis, articles were graded by type of evidence for association of risk factor with pesticide exposure as follows: 1 = association demonstrated in farmworkers; 2 = association demonstrated in nonfarmworker sample; 3 = plausible association proposed for farmworkers; or 4 = association plausible but not published for farmworkers. Of more than 80 studies we identified, only a third used environmental or biomarker evidence to document farmworker exposure to pesticides. Summaries of articles were compiled by level of evidence and presented in tabular form. A minimum list of data to be collected in farmworker pesticide studies was derived from these evidence tables. Despite ongoing concern about pesticide exposure of farmworkers and their families, relatively few studies have tried to test directly the association of behavioral and environmental factors with pesticide exposure in this population. Future studies should attempt to use similar behavioral, environmental, and psychosocial measures to build a body of evidence with which to better understand the risk factors for pesticide exposure among farmworkers.

Keywords: Agricultural Community, Agricultural Workers, Central Washington-State, Citation, Databases, Farm-Workers, Folk Belief, Health, Lawn Applications, Literature, Migrant, North-Carolina, Perceptions, Personal Protective Equipment, Preschool-Children, Psychosocial Stressors, Safety, Safety Behavior

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Full Text: [2007\Env Hea Per115, 1264.pdf](2007/Env%20Hea%20Per115,%201264.pdf)

Abstract: OBJECTIVE: Health or disease is shaped for all individuals by interactions between their genes and environment. Exactly how the environment changes gene expression and how this can lead to disease are being explored in a fruitful new approach to environmental health research, representative studies of which are reviewed here. DATA SOURCES: We searched Web of Science and references of relevant publications to understand the diversity of gene regulatory mechanisms affected by environmental exposures with disease implications. DATA SYNTHESIS: Pharmaceuticals, pesticides, air pollutants, industrial chemicals, heavy metals, hormones, nutrition, and behavior can change gene expression through a broad array of gene regulatory mechanisms. Mechanisms include regulation of gene translocation, histone modifications, DNA methylation, DNA repair, transcription, RNA stability, alternative RNA splicing, protein degradation, gene copy number, and transposon activation. Furthermore, chemically induced changes in gene regulation are associated with serious and complex human diseases, including cancer, diabetes and obesity, infertility, respiratory diseases, allergies, and neurodegenerative disorders such as Parkinson and Alzheimer diseases. One of the best-studied areas of gene regulation is epigenetics, especially DNA methylation. Our examples of environmentally induced changes in DNA methylation are presented in the context of early development, when methylation patterns are initially laid down. This approach highlights the potential role for altered DNA methylation in fetal origins of adult disease and inheritance of acquired genetic change. CONCLUSIONS: The reviewed studies indicate that genetic predisposition for disease is best predicted in the context of environmental exposures. Second, the genetic mechanisms investigated in these studies offer new avenues for risk assessment research. Finally, we are likely to witness dramatic improvements in human health, and reductions in medical costs, if environmental pollution is decreased.

Keywords: 2,3,7,8-Tetrachlorodibenzo-P-Dioxin TCDD, Activator Messenger-RNA, Adult, Airway Epithelial-Cells, Alpha-Synuclein, Alzheimer, Assessment, Cancer, Chemicals, Costs, Development, Diabetes, Diesel Exhaust Particles, Disease, Disease Risk, DNA, DNA Methylation, Drug Resistance, Endocrine Disruption, Environment, Environmental, Environmental Health, Environmental Health Research, Epigenetics, Escherichia-Coli, Etiology, Fetal Origins of Adult Disease, Gene Expression, Gene Regulation, Genetic, Health, Heavy Metals, Human, Induced, Lead, Medical, Nutrition, Obesity, Parkinsons-Disease, Pollutants, Primordial Germ-Cells, Prostate-Cancer, Publications, Research, Risk, Risk Assessment, Rna, Science, Smooth-Muscle-Cells, Susceptibility, Web of Science

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Full Text: [2008\Env Hea Per116, 278.pdf](2008/Env%20Hea%20Per116,%20278.pdf)

Abstract: OBJECTIVE: Unreclaimed mine tailings sites are a worldwide problem, with thousands of unvegetated, exposed tailings piles presenting a source of contamination for nearby communities. Tailings disposal sites in and and semiarid environments are especially subject to eolian dispersion and water erosion. Phytostabilization, the use of plants for in situ stabilization of tailings and metal contaminants, is a feasible alternative to costly remediation practices. In this review we emphasize considerations for phytostabilization of mine tailings in and and semiarid environments, as well as issues impeding its long-term success. DATA SOURCES: We reviewed literature addressing mine closures and revegetation of mine tailings, along with publications evaluating plant ecology, microbial ecology, and soil properties of mine tailings. DATA EXTRACTION: Data were extracted from peer-reviewed articles and books identified in Web of Science and Agricola databases, and publications available through the U.S. Department of Agriculture, U.S. Environmental Protection Agency, and the United Nations Environment Programme. DATA SYNTHESIS: Harsh climatic conditions in and and semiarid environments along with the innate properties of mine tailings require specific considerations. Plants suitable for phytostabilization must be native, be drought-, salt-, and metal-tolerant, and should limit shoot metal accumulation. Factors for evaluating metal accumulation and toxicity issues are presented. Also reviewed are aspects of implementing phytostabilization, including plant growth stage, amendments, irrigation, and evaluation. CONCLUSIONS: Phytostabilization of mine tailings is a promising remedial technology but requires farther research to identify factors affecting its long-term success by expanding knowledge of suitable plant species and mine tailings chemistry in ongoing field trials.

Keywords: Arid, Community Structure, Contaminated Soils, Databases, Erosion, Evaluation, Extraction, Growth, Knowledge, Literature, Metal Accumulation, Mine Tailings, New-Mexico, New-Zealand, Phytostabilization, Plant, Plant Establishment, Plants, Publications, Remediation, Research, Revegetation, Revegetation, Review, Science, Semiarid, Success, Toxicity, Vegetation Establishment, Wastes, Web of Science

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Full Text: [2008\Env Hea Per116, 583.pdf](2008/Env%20Hea%20Per116,%20583.pdf)

Abstract: OBJECTIVE: Federal, state, and private research agencies and organizations have faced increasing administrative and public demand for performance measurement. Historically, performance measurement predominantly consisted of near-term outputs measured through bibliometrics. The recent focus is on accountability for investment based on long-term outcomes. Developing measurable outcome-based metrics for research programs has been particularly challenging, because of difficulty linking research results to spatially and temporally distant outcomes. Our objective in this review is to build a logic model and associated metrics through which to measure the contribution of environmental health research programs to improvements in human health, the environment, and the economy. DATA SOURCES: We used expert input and literature research on research impact assessment. DATA EXTRACTION: With these sources, we developed a logic model that defines the components and linkages between extramural environmental health research grant programs and the outputs and outcomes related to health and social welfare, environmental quality and sustainability, economics, and quality of life. DATA SYNTHESIS: The logic model focuses on the environmental health research portfolio of the National Institute of Environmental Health Sciences (NIEHS) Division of Extramural Research and Training. The model delineates pathways for contributions by five types of institutional partners in the research process: NIEHS, other government (federal, state, and local) agencies, grantee institutions, business and industry, and community partners. CONCLUSIONS: The model is being applied to specific NIEHS research applications and the broader research community. We briefly discuss two examples and discuss the strengths and limits of outcome-based evaluation of research programs.

Keywords: Assessment, Bibliometrics, Children, Conceptual Model Development, Environmental Health, Environmental Health Research, Epidemiologic Evidence, Evaluation, Impact, Literature, Measurement, Metrics Development, Mortality, Particulate Air-Pollution, Performance Measurement, Quality, Research, Research Impact Evaluation, Research Results

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Full Text: [2009\Env Hea Per117, 675.pdf](2009/Env%20Hea%20Per117,%20675.pdf)

Abstract: OBJECTIVE: Anti-infectives are constantly discharged at trace levels in natural waters near urban centers and agricultural areas. They represent a cause for concern because of their potential contribution to the spread of anti-infective resistance in bacteria and other effects on aquatic biota. We compiled data on the occurrence of anti-infectives published in the last 24 years in environmental water matrices. The collected information was then compared with the available ecotoxicologic values to evaluate potential environmental concerns. DATA SOURCES: We used Web of Science and Google Scholar to search for articles published in peer-reviewed journals written in the English language since 1984. DATA EXTRACTION: Information on compound concentrations in wastewaters and natural and drinking waters, the source of contamination, country of provenance of the samples, year of publication, limits of quantification, and method of analysis was extracted. DATA SYNTHESIS: From the 126 different Substances analyzed in environmental waters, 68 different parent compounds and 10 degradation products or metabolites have been quantified to date. Environmental concentrations vary from about 10(-1) to 10(9) ng/L, depending on the compound, the matrix, and the source of contamination. CONCLUSIONS: Detrimental effects of anti-infectives on aquatic microbiota are possible with the constant exposure of sensitive species. Indirect impact on human health cannot be ruled out when considering the potential contribution of high anti-infective concentrations to the spreading of antiinfective resistance in bacteria.

Keywords: Analysis, Antibacterials, Antibiotics, Antimicrobials, Aquatic Environment, Aquatic Environment, Bacteria, Contribution, Drinking Water, Environmental, Extraction, Google Scholar, Groundwater, Human, Impact, Information, Journals, Liquid-Chromatography, Metabolites, National Reconnaissance, Parent, Personal Care Products, Pharmaceutically Active Compounds, Production Waste-Water, Publication, Resistance, Review, Science, Solid-Phase Extraction, Surface Water, Swine Production Facilities, Tandem Mass-Spectrometry, Tetracycline Resistance Genes, Urban, Wastewater, Web of Science

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Full Text: [2009\Env Hea Per117, 1147.pdf](2009/Env%20Hea%20Per117,%201147.pdf)

Abstract: BACKGROUND: In the past 15 years, asthma prevalence has increased and is disproportionately distributed among children, minorities, and low-income persons. The National Institute of Environmental Health Sciences (NIEHS) Division of Extramural Research and Training developed a framework to measure the scientific and health impacts of its extramural asthma research to improve the scientific basis for reducing the health effects of asthma. OBJECTIVES: Here we apply the framework to characterize the NIEHS asthma portfolio’s impact in terms of publications, clinical applications of findings, community interventions, and technology developments. METHODS: A logic model was tailored to inputs, outputs, and outcomes of the NIEHS asthma portfolio. Data from existing National Institutes of Health (NIH) databases are used, along with publicly available bibliometric data and structured elicitation of expert judgment. RESULTS: NIEHS is the third largest source of asthma-related research grant funding within the NIH between 1975 and 2005, after the National Heart, Lung, and Blood Institute and the National Institute of Allergy and Infectious Diseases. Much of NIEHS-funded asthma research focuses on basic research, but results are often published in journals focused on clinical investigation, increasing the likelihood that the work is moved into practice along the “bench to bedside” continuum. NIEHS support has led to key breakthroughs in scientific research concerning susceptibility to asthma, environmental conditions that heighten asthma symptoms, and cellular mechanisms that may be involved in treating asthma. CONCLUSIONS: If gaps and limitations in publicly available data receive adequate attention, further linkages can be demonstrated between research activities and public health improvements. This logic model approach to research impact assessment demonstrates that it is possible to conceptualize program components, mine existing databases, and begin to show longer-term impacts of program results. The next challenges will be to modify current data structures, improve the linkages among relevant databases, incorporate as much electronically available data as possible, and determine how to improve the quality and health impact of the science that we support.

Keywords: Assessment, Asthma, Care, Children, Children, Community, Evaluation Methodology, Health Impact Analysis, Minorities, Outcomes, Policy, Public Health, Publications, Pulmonary Organ Systems, Disease Processes, Quality, Research, Sciences, Scientific Research, Susceptible Populations

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Full Text: [2009\Env Hea Per117, 1823.pdf](2009/Env%20Hea%20Per117,%201823.pdf)

Abstract: OBJECTIVE: Although industrial sectors involving semiconductors; memory and storage technologies; display, optical, and photonic technologies; energy; biotechnology; and health care produce the most products that contain nanomaterials, nanotechnology is also used as an environmental technology to protect the environment through pollution prevention, treatment, and clean up. In this review, we focus on environmental cleanup and provide a background and overview of current practice; research findings; societal issues; potential environment, health, and safety implications; and future directions for nanoremediation. We do not present an exhaustive review of chemistry/engineering methods of the technology but rather an introduction and summary of the applications of nanotechnology in remediation. We also discuss nanoscale zero-valent iron in detail. DATA SOURCES: We searched the Web of Science for research studies and accessed recent publicly available reports from the U.S. Environmental Protection Agency and other agencies and organizations that addressed the applications and implications associated with nanoremediation techniques. We also conducted personal interviews with practitioners about specific site remediations. DATA SYNTHESIS: We aggregated information from 45 sites, a representative portion of the total projects under way, to show nanomaterials used, types of pollutants addressed, and organizations responsible for each site. CONCLUSIONS: Nanoremediation has the potential not only to reduce the overall costs of cleaning up large-scale contaminated sites but also to reduce cleanup time, eliminate the need for treatment and disposal of contaminated soil, and reduce some contaminant concentrations to near zero-all in situ. Proper evaluation of nanoremediation, particularly full-scale ecosystem-wide studies, needs to be conducted to prevent any potential adverse environmental impacts.

Keywords: Biotechnology, C-60, Costs, Ecotoxicology, Engineered Nanoparticles, Environment, Environmental, Environmental Implications, Environmental Technology, Evaluation, Field, Hazardous Wastes, Health Care, Information, Iron, Memory, Nanoremediation, Nanoscale Iron Particles, Nanotechnology, Overview, Pollutants, Practice, Prevention, Remediation, Research, Review, Safety, Science, Suspensions, Toxicity, Transport, Treatment, Waste Sites, Water, Web of Science, Zero-Valent Iron, Zero-Valent Iron, Zerovalent Iron

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Full Text: [2010\Env Hea Per118, 1146.pdf](2010/Env%20Hea%20Per118,%201146.pdf)

Abstract: BACKGROUND: Recent articles have advocated for the use of qualitative methods in environmental health research. Qualitative research uses nonnumeric data to understand people’s opinions, motives, understanding, and beliefs about events or phenomena. OBJECTIVE: In this analysis of the literature, I report the use of qualitative methods and data in the study of the relationship between environmental exposures and human health. DATA SOURCES: A primary search on ISI Web of Knowledge/ Web of Science for peer-reviewed journal articles dated from 1991 through 2008 included the following three terms: qualitative, environ\*, and health. Inclusion and exclusion criteria are described. DATA EXTRACTION: Searches resulted in 3,155 records. Data were extracted and findings of articles analyzed to determine where and by whom qualitative environmental health research is conducted and published, the types of methods and analyses used in qualitative studies of environmental health, and the types of information qualitative data contribute to environmental health. DATA SYNTHESIS: Ninety-one articles met inclusion criteria. These articles were published in 58 different journals, with a maximum of eight for a single journal. The results highlight a diversity of disciplines and techniques among researchers who used qualitative methods to study environmental health, with most studies relying on one-on-one interviews. Details of the analyses were absent from a large number of studies. Nearly all of the studies identified increased scientific understanding of lay perceptions of environmental health exposures. DISCUSSION AND CONCLUSIONS: Qualitative data are published in traditionally quantitative environmental health studies to a limited extent. However, this analysis demonstrates the potential of qualitative data to improve understanding of complex exposure pathways, including the influence of social factors on environmental health, and health outcomes.

Keywords: Air-Pollution, Analysis, Anthropology, Breast-Cancer, Community, Environmental, Environmental Epidemiology, Environmental Health, Environmental Health Research, Extraction, Focus Groups, Health, Health Outcomes, Human, Information, Isi, Journal, Journals, Literature, Mixed Methods, Outcomes, Parents Perceptions, Participatory Research, Participatory Research, Perceptions, Pesticide Exposure, Physical-Activity, Primary, Qualitative Methods, Quantitative, Research, Researchers, Risk-Factors, Science, Social, Sociology, Theory, Urban-Industrial Neighborhood, Web of Science

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Full Text: [2010\Env Hea Per118, 1676.pdf](2010/Env%20Hea%20Per118,%201676.pdf)

Abstract: BACKGROUND: Cadmium exposure has been inconsistently related to blood pressure. OBJECTIVES: We updated and reevaluated the evidence regarding the relationships of blood cadmium (BCd) and urine cadmium (UCd) with blood pressure (BP) and hypertension (HTN) in nonoccupationally exposed populations. DATA SOURCES AND EXTRACTION: We searched PUBMED and Web of Science for articles on BCd or UCd and BP or HTN in nonoccupationally exposed populations and extracted information from studies that provided sufficient data on population, smoking status, exposure, outcomes, and design. DATA SYNTHESIS: Twelve articles met inclusion criteria: eight provided data adequate for comparison, and five reported enough data for meta-analysis. Individual studies reported significant positive associations between BCd and systolic BP (SBP) among nonsmoking women [beta = 3.14 mmHg per 1 mu g/L untransformed BCd; 95% confidence interval (CI), 0.14-6.14] and among premenopausal women (beta = 4.83 mmHg per 1 nmol/L log-transformed BCd; 95% CI, 0.17-9.49), and between BCd and diastolic BP (DBP) among women (beta = 1.78 mmHg comparing BCd in the 90th and 10th percentiles; 95% CI, 0.64-2.92) and among premenopausal women (beta = 3.84 mmHg per 1 nmol/L log-transformed BCd; 95% CI, 0.86-6.82). Three meta-analyses, each of three studies, showed positive associations between BCd and SBP (p = 0.006) and DBP (p < 0.001) among women, with minimal heterogeneity (I(2) = 3%), and a significant inverse association between UCd and HTN among men and women, with substantial heterogeneity (I(2) = 80%). CONCLUSION: Our results suggest a positive association between BCd and BP among women; the results, however, are inconclusive because of the limited number of representative population-based studies of never-smokers. Associations between UCd and HTN suggest inverse relationships, but inconsistent outcome definitions limit interpretation. We believe a longitudinal study is merited.

Keywords: Association, Blood, Blood Pressure, Cadmium, Definitions, Extraction, Health, Homocysteine, Hypertension, Information, Interpretation, Lead, Masked Hypertension, Meta Analysis, Meta-Analysis, Occupational Exposure, Outcome, Outcomes, Peripheral Arterial-Disease, Population, Pressure, Pubmed, Review, Risk-Factors, Science, Smoking, Smoking, Systematic, Systematic Review, Urine, Web of Science, Women

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Full Text: [2011\Env Hea Per119, 431.pdf](2011/Env%20Hea%20Per119,%20431.pdf)

Abstract: OBJECTIVE: Electronic waste (e-waste) has been an emerging environmental health issue in both developed and developing countries, but its current management practice may result in unintended developmental neurotoxicity in vulnerable populations. To provide updated information about the scope of the issue, presence of known and suspected neurotoxicants, toxicologic mechanisms, and current data gaps, we conducted this literature review. DATA SOURCES: We reviewed original articles and review papers in PUBMED and Web of Science regarding e-waste toxicants and their potential developmental neurotoxicity. We also searched published reports of intergovernmental and governmental agencies and nongovernmental organizations on e-waste production and management practice. DATA EXTRACTION: We focused on the potential exposure to e-waste toxicants in vulnerable populations-that is, pregnant women and developing children-and neurodevelopmental outcomes. In addition, we summarize experimental evidence of developmental neurotoxicity and mechanisms. DATA SYNTHESIS: In developing countries where most informal and primitive e-waste recycling occurs, environmental exposure to lead, cadmium, chromium, polybrominated diphenyl ethers, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons is prevalent at high concentrations in pregnant women and young children. Developmental neurotoxicity is a serious concern in these regions, but human studies of adverse effects and potential mechanisms are scarce. The unprecedented mixture of exposure to heavy metals and persistent organic pollutants warrants further studies and necessitates effective pollution control measures. CONCLUSIONS: Pregnant women and young children living close to informal e-waste recycling sites are at risk of possible perturbations of fetus and child neurodevelopment.

Keywords: Adverse Effects, Blood Lead, Brominated Flame Retardants, Cadmium, Child, Children, Chromium, Control, Developing Countries, Developmental Neurotoxicity, Dibenzo-p-Dioxins, E-Waste, Environmental, Environmental Health, Environmental Lead-Exposure, Epigenetics, Extraction, Health, Heavy Metals, Human, Information, Lead, Literature, Literature Review, Management, Mercury, Outcomes, Oxidative-Stress, Papers, Pollutants, Polybrominated Diphenyl Ethers, Polybrominated Diphenyl Ethers, Polychlorinated-Biphenyls, Practice, Pregnant Women, Prenatal Exposure, Pubmed, Randomized Clinical-Trial, Review, Risk, Science, Thyroid-Hormone Levels, Toxicologic Mechanisms, Vulnerable Populations, Web of Science, Women

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Full Text: [2011\Env Hea Per119, 1681.pdf](2011/Env%20Hea%20Per119,%201681.pdf)

Abstract: BACKGROUND: Heat-related mortality is a matter of great public health concern, especially in the light of climate change. Although many studies have found associations between high temperatures and mortality, more research is needed to project the future impacts of climate change on heat-related mortality. OBJECTIVES: We conducted a systematic review of research and methods for projecting future heat-related mortality under climate change scenarios. DATA SOURCES AND EXTRACTION: A literature search was conducted in August 2010, using the electronic databases PubMed, Scopus, Science Direct, Pro Quest, and Web of Science. The search was limited to peer-reviewed journal articles published in English from January 1980 through July 2010. DATA SYNTHESIS: Fourteen studies fulfilled the inclusion criteria. Most projections showed that climate change would result in a substantial increase in heat-related mortality. Projecting heat-related mortality requires understanding historical temperature mortality relationships and considering the future changes in climate, population, and acclimatization. Further research is needed to provide a stronger theoretical framework for projections, including a better understanding of socioeconomic development, adaptation strategies, land-use patterns, air pollution, and mortality displacement. CONCLUSIONS: Scenario-based projection research will meaningfully contribute to assessing and managing the potential impacts of climate change on heat-related mortality.

Keywords: Adaptation, Climate Change, Databases, Deaths, Development, English, Extraction, Heat Wave, High Ambient-Temperature, Impacts, Journal, Literature, Model Construction, Mortality, Pollution, Projection, Public Health, Public-Health, Pubmed, Research, Review, Scenario, Science, Scopus, Stress, Systematic, Systematic Review, Temperature, United-States, US Cities, Warning Systems, Wave, Web of Science

# Title: Environmental Health Series. [RH] Radiological Health

Full Journal Title: Environmental Health Series. [RH] Radiological Health

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ISSN: 0071-0911

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Journal Country/Territory:

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Subject Categories:

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Full Journal Title: Environmental Knowledge Organization and Information Management

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

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Keywords: Publications

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(Environ. Lett.)

後期刊名Journal of Environmental Science and Health. Part A. Environmental Science and Engineering 0360-1226, Journal of Environmental Science and Health. Part B. Pesticides, Food Contaminants, and Agricultu

Full Journal Title: [Environmental Letters](http://www.informaworld.com/smpp/title~db=all~content=t914318584~tab=issueslist)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

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Publisher Address:

Subject Categories:

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Keywords: Adsorption, Pesticide

? Lakshminarayana, J.S. (1975), Prevention of sewage pollution by stabilization ponds. *Environmental Letters*, **8** (2), 121-134.

Full Text: [1960-80\Env Let8, 121.pdf](1960-80/Env%20Let8,%20121.pdf)

Abstract: Water is polluted when it constitutes a health hazard or when its usefulness is impaired. The major sources of water pollution are municipal, manufacturing, mining, steam, electric power, cooling and agricultural. Municipal or sewage pollution forms a greater part of the man’s activity and it is the immediate need of even smaller communities of today to combat sewage pollution. It is needless to stress that if an economic balance of the many varied services which a stream or a body of water is called upon to render is balanced and taken into consideration one could think of ending up in a wise management programme. In order to eliminate the existing water pollutional levels of the natural water one has to think of preventive and treatment methods. of the various conventional and non-conventional methods of sewage treatment known today, in India, where the economic problems are complex, the waste stabilization ponds have become popular over the last two decades to let Public Health Engineers use them with confidence as a simple and reliable means of treatment of sewage and certain industrial wastes, at a fraction of the cost of conventional waste treatment plants used hitherto. A waste stabilization pond makes use of natural purification processes involved in an ecosystem through the regulating of such processes. The term “waste stabilization pond” in its simplest form is applied to a body of water, artificial or natural, employed with the intention of retaining sewage or organic waste waters until the wastes are rendered stable and inoffensive for discharge into receiving waters or on land, through physical, chemical and biological processes commonly referred to as “self-purification” and involving the symbiotic action of algae and bacteria under the influence of sunlight and air. Organic matter contained in the waste is stabilized and converted in the pond into more stable matter in the form of algal cells which find their way into the effluent and hence the term “stabilization pond”.

? OBrien, J.E. and Majewski, J.C. (1975), Effects of de-icing salt on ground water characteristics. *Environmental Letters*, **8** (4), 303-313.

Full Text: [1960-80\Env Let8, 303.pdf](1960-80/Env%20Let8,%20303.pdf)

Abstract: The effect of “road salt” on the characteristics of Massachusetts drinking water supplies has been significant and cumulative rather than transient or seasonal. De-icing salt is essentially all sodium chloride. Calcium chloride accounted for only three percent of the total salt used. However, hardness content, as well as sodium ion concentration, has increased greatly in ground waters in the past decade. The changing composition of our water supplies has agricultural, economic, and public health implications. This study attempts to quantify the stoichiometry of these changes in concentration, which are in part due to an ion-exchange mechanism in the soil.

? Bunn, W.W., Haas, B.B., Deane, E.R. and Kleopfer, R.D. (1975), Formation of trihalomethanes by chlorination of surface water. *Environmental Letters*, **10** (3), 205-213.

Full Text: [1960-80\Env Let10, 205.pdf](1960-80/Env%20Let10,%20205.pdf)

Abstract: Chloroform, bromodichloromethane, dibromochloromethane, bromoform, and dichloroiodomethane have been found in chlorinated drinking water. In addition to these five compounds, the other possible trihalomethanes (chlorodiiodomethane, bromochloroiodo-methane, dibromoiodomethane, bromodiiodomethane, and iodoform) can also be formed by chlorination of surface water containing bromides and iodides. Mass spectra for each of these ten compounds were obtained.

Keywords: Trihalomethanes, Drinking Water, Chlorination, Chloroform

# Title: Environmental Management

Full Journal Title: [Environmental Management](http://springerlink.metapress.com/content/100370/?p=18fc2661ec3a4c7e9cda8ac380ab6ead&pi=0), [Environmental Management](http://www.springeronline.com/sgw/cda/frontpage/0,11855,5-175-70-1040297-0,00.html)

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Subject Categories:

Environmental Sciences: Impact Factor 0.976, 49/126 (1999), Impact Factor 0.822, 64/127 (2000)

? Khordagui, H.K. (1992), A conceptual-approach to selection of a control measure for residual chlorine discharge in Kuwait bay. *Environmental Management*, **16** (3), 309-316.

Full Text: [1992\Env Mol Mut16, 309.pdf](1992/Env%20Mol%20Mut16,%20309.pdf)

Abstract: It is estimated that some 17 metric tons of residual oxidants (chlorine) are discharged into the enclosed coastal seawater of Kuwait on a daily basis from power-*Desalination* plants alone. Alarmed by the unlimited number of reported cases of damage to marine aquatic systems due to chlorine discharge around the world. Several alternatives were proposed to control such a massive discharge of residual oxidant into seawaters. Most of the proposed alternatives lacked the basic criteria necessary for their evaluation, justification, and then selection. The objective of this article is to provide a conceptual approach that can be used to select a control measure for residual oxidant discharge in Kuwait coastal seawaters. This approach is based on state-of-the-art knowledge and the unique operational and environmental factors involved. A matrix system was designed whereby the cost of residual chlorine control alterative, its effectiveness, and environmental and public health impact, performance, and reliability in Kuwait can be compared and evaluated. The selection approach considered currently operating power plants in terms of their engineering design and material (cast iron or steel condensers), current operational conditions, operator’s perception, acceptability, and projected problems associated with the Environmental Management of proposed modifications. The Proposed approach revealed that in Kuwait, conventinal chlorination was marginally superseded only by chlorination/dechlorination using SO2 and operation alteration using process optimization. The overall cost-effective assessment matrix classified other alternatives as worse than chlorination by various degrees. Ozone and UV were found to be the worst and the least desirable alternatives for biofouling control of seawater in Kuwait. In light of the available information on the consequences of the Gulf War on the marine environment, and the potential formation of additional halogenated organic compounds through the reaction of residual chlorine with the released petroleum hydrocarbons, it is essential to control residual chlorine discharged into the nearshore environment of Kuwait.

Notes: highly cited

? Long, E.R., Macdonald, D.D., Smith, S.L. and Calder, F.D. (1995), Incidence of adverse biological effects within ranges of chemical concentrations in marine and estuarine sediments. *Environmental Management*, **19** (1), 81-97.

Full Text: [1995\Env Mol Mut19, 81.pdf](1995/Env%20Mol%20Mut19,%2081.pdf)

Abstract: Matching biological and chemical data were compiled from numerous modeling, laboratory, and field studies performed in marine and estuarine sediments. Using these data, two guideline values (an effects range-low and an effects range-median) were determined for nine trace metals, total PCBs, two pesticides, 13 polynuclear aromatic hydrocarbons (PAHs), and three classes of PAHs. The two values defined concentration ranges that were: (1) rarely, (2) occasionally, or (3) frequently associated with adverse effects. The values generally agreed within a factor of 3 or less with those developed with the same methods applied to other data and to those developed with other effects-based methods. The incidence of adverse effects was quantified within each of the three concentration ranges as the number of cases in which effects were observed divided by the total number of observations. The incidence of effects increased markedly with increasing concentrations of all of the individual PAHs, the three classes of PAHs, and most of the trace metals. Relatively poor relationships were observed between the incidence of effects and the concentrations of mercury, nickel, total PCB, total DDT and p,p’-DDE. Based upon this evaluation, the approach provided reliable guidelines for use in sediment quality assessments. This method is being used as a basis for developing National sediment quality guidelines for Canada and informal, sediment quality guidelines for Florida.

Keywords: Acute Toxicity, Adverse Effects, Approach, Assessments, Biological, Biological Effects, Canada, Chemical, Concentration, Contaminants, Data, DDT, Developing, Ecological Risk Assessment, Estuarine, Estuarine Sediments, Evaluation, Field, Fish, Florida, Guideline, Guidelines, Harbor, Incidence, Marine, Mercury, Metals, Methods, Modeling, Nickel, PAHs, PCB, PCBs, Pesticides, Polynuclear Aromatic Hydrocarbons, Quality, Quality Criteria, Sediment, Sediment Quality, Sediment Quality Guidelines, Sediments, Total PCBs, Trace Metals

Jim, C.Y. (1996), Proliferation of nonconforming land uses in agricultural envelope of urban Hong Kong. *Environmental Management*, **20** (4), 461-474.

Full Text: [1996\Env Mol Mut20, 461.pdf](1996/Env%20Mol%20Mut20,%20461.pdf)

Abstract: Until the late 1960s rural Hong Kong had an attractive rustic landscape and a small but active farming population. The recent widespread agricultural decline provided opportunities for urban-oriented activities to invade, mainly as open storage and workshops unsuitable in city areas. Rapid container-port expansion and cross-border China trade generate demands for cheap and accessible land for non-conforming uses (NCU). Rural development control and land-use planning are inherently weak and formal provision for such uses is lacking. An unfavorable landmark court judgement allows landowners to degrade the countryside. The activities have caused acute environmental problems, telescoped into a small territory, including visual blight, pollution, drainage blockage, loss of wetland habitats and increased flooding hazard. The distinction between urban and rural has been blurred in the destruction of the valuable countryside heritage. An interim legislative amendment fails to stop unauthorized conversion of farmland. In the long term, an integrated and comprehensive rural planning strategy to conserve inherent elements, as well as accommodating selected urban spillover in properly located and serviced sites, is needed.

? Heydlauff, D.E. (1996), Managing for biodiversity from the electric utilities’ perspective. *Environmental Management*, **20** (6), 963-966.

Full Text: [1996\Env Mol Mut20, 963.pdf](1996/Env%20Mol%20Mut20,%20963.pdf)

Abstract: The quality and sustainability of the natural environment is a matter of inestimable value and is critical to public health and welfare. Ail species have a purpose, and they exist for the betterment OI other species. It is, therefore, incumbent on all humans to do their part in the preservation of this vast, diverse ecosystem called Earth. All humans are the beneficiaries, the ultimate customers, of a sound environment-water that is safe to drink, air that can be breathed, and soil that will sustain crops. There must be a commitment to leaving a clean and healthy planet for generations to follow, an earth which is enhanced, not diminished, by humans’ presence.

Keywords: Biodiversity, Environmental Excellence, Electric Industry Competition, Stakeholder Expectations, Balanced Policies, Communication

Yeager, K.E. (1996), The exuberant planet: A global look at the role of utilities in protecting biodiversity. *Environmental Management*, **20** (6), 967-971.

Full Text: [1996\Env Mol Mut20, 967.pdf](1996/Env%20Mol%20Mut20,%20967.pdf)

Abstract: Biodiversity is a critical environmental issue. Biodiverse species as a source of unique genetic information, for example, continues to provide society with lifesaving drugs and important industrial chemicals. Since US utilities are substantial landholders and virtually every aspect of utility operations are in some way tied to environmental/biodiversity issues, it is important and essential that the utility industry step forward as a leader. This paper details the past, present, and future role that utilities have played and need to play in the very important arena of biodiversity.

Keywords: Biodiversity, Utilities, Policy, Scientist, Regulators

Jim, C.Y. (1998), Soil characteristics and management in an urban park in Hong Kong. *Environmental Management*, **22** (5), 683-695.

Full Text: [E\Env Mol Mut22, 683.pdf](E/Env%20Mol%20Mut22,%20683.pdf)

Abstract The limited acreage of Hong Kong’s urban parks receives a huge number of visitors, imposing a heavy strain on the soil base. Most parks show widespread trampling-induced soil degradation, such as bare patches and compaction. These symptoms erode the quality of amenity vegetation and recreational experience. Soil in the most popular park was studied through detailed field and laboratory analysis of six pits denoting different levels of user impacts. Soil profiles show unnatural stratification and poor structure of decomposed granite fill materials used in reclaiming the land from the sea. Marked compaction in surface layers is induced by foot-traffic pressure, with aggregate breakdown and formation of platy structure. Compaction in subsoil layers is inherited from construction damage that persists 40 years after park opening. The predominantly coarse texture has been packed to high bulk densities exceeding the 1.75 Mg/m3 threshold. With diminished porosity, transmission of air and water, storage of plant-available moisture, and root growth suffer. Chemically, the samples have an unnatural alkaline pH, inadequate organic matter, nitrogen, phosphorus, exchangeable cations, and limited cation exchange capacity. The results can help park-soil management, including the need to evaluate soil in planned park sites, salvage high-grade soil parcels, prevent construction damage, ameliorate structure by mechanical operations and suitable amendments, and replace site soil of very poor quality. Edaphic problems can be forestalled or solved by treating soil as an integral component of park planning and management based on scientific principles and methods.

Keywords: Urban Soil, Urban Park, Trampling Impact, Soil Compaction, Soil Management, Hong Kong, Country Park, Compaction, Vegetation, Impacts

# Title: Environmental Modelling & Software

Full Journal Title: Environmental Modelling & Software

ISO Abbreviated Title:

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ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Massabó, M., Cianci, R. and Paladino, O. (2006), Some analytical solutions for two-dimensional convection–dispersion equation in cylindrical geometry. *Environmental Modelling & Software*, **21** (5), 681-688.

Full Text: [2006\Env Mod Sof21, 681.pdf](2006/Env%20Mod%20Sof21,%20681.pdf)

Abstract: In this paper some analytical solutions are given for a two-dimensional advection equation with anisotropic dispersion. Chemical decay or adsorption-like reaction inside the liquid phase is considered. Bessel function expansion is used to solve the second order PDE model with different initial conditions, corresponding to usual experimental practices. Cylindrical geometry is considered since large columns could be adopted to investigate both anisotropic dispersion and adsorption/desorption kinetic mechanisms.

Keywords: Bessel Functions, PDE, Analytical Solutions, Dispersion, Convection

# Title: Environmental and Molecular Mutagenesis

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Subject Categories:

Environmental Sciences: Impact Factor 1.990, 13/126 (1999), Impact Factor 2.278, 7/127 (2000)

Genetics & Heredity Toxicology: Impact Factor

Vartiainen, T. and Lampelo, S. (1990), Effects of human placental S9 and induced rat liver S9 on the mutagenicity of drinking waters processed from humus-rich surface waters. *Environmental and Molecular Mutagenesis*, **15** (4), 198-204.

Abstract: The mutagenicity of chlorinated drinking waters processed from humus-rich surface waters has been shown to be very high. The effect of placental S9 on the mutagenicity of drinking waters has not been studied previously. The purpose of this study was to compare the effects of human placental and rat liver microsomal fractions on the mutagenicity of drinking waters processed from humus-rich surface waters. The samples of 34 drinking and two raw waters from 26 localities in Finland were tested for mutagenicity in Ames Salmonella typhimurium tester strain TA100 with and without metabolic activations. Between the drinking water samples, clear differences were recorded in the presence of placental and rat liver S9, suggesting different mutagens in the drinking waters. Rat liver S9 decreased the mutagenicities of drinking water concentrates, but placental S9 increased, decreased, or had no effect. It is not known if placental mutagenicity enhancing system might cause any health hazard to a developing fetus.

Sato, T., Nagase, H., Sato, K., Niikawa, M. and Kito, H. (1994), Enhancement of the mutagenicity of amino acid pyrolysates by phthalate esters. *Environmental and Molecular Mutagenesis*, **24** (4), 325-331.

Abstract: The ability of phthalic acid, phthalic acid anhydride, and various phthalate esters to enhance the mutagenicity of many amino acid pyrolysates was observed with the Ames test (Salmonella typhimurium TA98), but not the SOS Chromotest. Phthalate enhancement of the mutagenicity of 4-nitroquinoline-1-oxide, 2-nitrofluorene, and benzo[a]pyrene was not observed with either test. The mutagenicity-enhancing ability may be related to the induction of enzymes such as P450IIB, that metabolize amino acid pyrolysates. By quantitative structure activity relationship (QSAR) analysis, a good correlation was observed between the mutagenicity-enhancing activity of phthalates and their octanol-water partition coefficients.

Jansson, K., Hyttinen, J.M., Niittykoski, M. and Mäki Paakkanen, J. (1995), Mutagenicity in vitro of 3, 4-dichloro-5-hydroxy-2 (5H)-furanone (mucochloric acid), a chlorine disinfection by-product in drinking water. *Environmental and Molecular Mutagenesis*, **25** (4), 284-287.

Abstract: The mutagenicity of chlorinated humic drinking waters is accounted for mainly by a single contaminant, 3-chloro-4-(dichloromethyl)-5-hydroxy-2 (5H)-furanone (MX), as assessed in Salmonella typhimurium strain TA100. In the present study 3, 4-dichloro-5-hydroxy-2 (5H)-furanone (mucochloric acid, MA), another drinking water contaminant much less potent as a mutagen in TA100 than MX, was tested in Chinese hamster ovary (CHO) cells for the induction of mutation at the hypoxanthine phosphoribosyl transferase (hprt) locus to 6-thioguanine resistance (TGr). Unexpectedly, MA induced TGr mutants in CHO cells with a potency comparable to that reported previously for MX. In subsequent experiments with, S. typhimurium, the presence of pKM101 plasmid in strain TA100 increased susceptibility to the mutagenicity of MA, but much less than to that of MX, relative to the parental strain TA1535 lacking pKM101. The difference between the two compounds in TA100 thus appears to be due to a higher enhancement of the mutagenicity of MX than that of MA by pKM101 mediated error-prone DNA repair.

Moore, L.E., Warner, M.L., Smith, A.H., Kalman, D. and Smith, M.T. (1996), Use of the fluorescent micronucleus assay to detect the genotoxic effects of radiation and arsenic exposure in exfoliated human epithelial cells. *Environmental and Molecular Mutagenesis*, **27** (3), 176-184.

Abstract: The exfoliated cell micronucleus (MN) assay using fluorescent in situ hybridization (FISH) with a centromeric probe is a rapid method for determining the mechanism of MN formation in epithelial tissues exposed to carcinogenic agents. Here, we describe the use of this assay to detect the presence or absence of centromeric DNA in MN induced in vivo by radiation therapy and chronic arsenic (As) ingestion. We examined the buccal cells of an individual receiving 6, 500 rads of photon radiation to the head and neck. Exfoliated cells were collected before, during, and after treatment. After radiation exposure a 16.6-fold increase in buccal cell MN frequency was seen. All induced MN were centromere negative (MN-) resulting from chromosome breakage. This finding is consistent with the clastogenic action of radiation and confirmed the reliability of the method. Three weeks post-therapy, MN frequencies returned to baseline. We also applied the assay to exfoliated bladder cells of 18 people chronically exposed to high levels of inorganic arsenic (In-As) in drinking water (average level, 1,312 micrograms As/L) and 18 matched controls (average level, 16 micrograms As/L). The combined increase in MN frequency was 1.8-fold (P = 0.001, Fisher’s exact test). Frequencies of micronuclei containing acentric fragments (MN-) and those containing whole chromosomes (MN+) both increased (1.65-fold, P = 0.07, and 1.37-fold, P = 0.15, respectively), suggesting that arsenic may have both clastogenic and weak aneuploidogenic properties in vivo. After stratification on sex, the effect was stronger in male than in female bladder cells. In males the MN-frequency increased 2.06-fold (P = 0.07) while the frequency of MN+ increased 1.86-fold (P = 0.08). In addition, the frequencies of MN-and MN+ were positively associated with urinary arsenic and its metabolites. However, the association was stronger for micronuclei containing acentric fragments. By using FISH with centromeric probes, the mechanism of chemically induced genotoxicity can now be determined in epithelial tissues.

Mäki-Paakkanen, J., Kurttio, P., Paldy, A. and Pekkanen, J. (1998), Association between the clastogenic effect in peripheral lymphocytes and human exposure to arsenic through drinking water. *Environmental and Molecular Mutagenesis*, **32** (4), 301-313.

Full Text: [E\Env Mol Mut32, 301.pdf](E/Env%20Mol%20Mut32,%20301.pdf)

Abstract: We describe the association between structural chromosome aberrations (CAs) and parameters of exposure to arsenic among 42 individuals exposed to arsenic through well waters in Finland. The median concentration of arsenic in the wells was 410 microg/l, the total arsenic concentrations in urine (As-tot) was 180 microg/l, and in hair 1.3 microg/g, for current users (n = 32) of contaminated wells. Urinary arsenic species and CAs were also analyzed in eight control individuals from the same village who consumed water which contained arsenic <1.0 microg/l (detection limit). Increased arsenic exposure, indicated best by increased concentrations of arsenic species (inorganic arsenic, methylarsonic acid (MMA), dimethylarsinic acid (DMA)) in urine, was associated with increased frequency of CAs. The increased urinary ratio of MMA/As-tot and the decreased ratio of DMA/As-tot were associated with increased CAs when all aberration types, including gaps, were considered. Associations between CAs and arsenic exposure indicators were stronger among current users than among persons who had stopped using the contaminated well water for 2-4 months before sampling (ex-users, n = 10). Furthermore, there was a positive but not statistically significant association between CAs and arsenic in hair among the current users, but not among the ex-users, who still had relatively high arsenic concentrations in hair. The results suggest that the effect observed in the present study reflects relatively recent arsenic exposure.

Bolognesi, C., Landini, E., Roggieri, P., Fabbri, R. and Viarengo, A. (1999), Genotoxicity biomarkers in the assessment of heavy metal effects in mussels: Experimental studies. *Environmental and Molecular Mutagenesis*, **33** (4), 287-292.

Full Text: [E\Env Mol Mut33, 287.pdf](E/Env%20Mol%20Mut33,%20287.pdf)

Abstract: Heavy metals are stable and persistent environmental contaminants. The range of metal concentrations is generally below acute thresholds in coastal areas, where recognition of chronic sublethal effects is more relevant. Evidence of long-term adverse effects, such as cancer, due to heavy metals in marine animals comes from a number of field and experimental studies. The mechanism of metal carcinogenicity remains largely unknown, although several lines of experimental evidence suggest that a genotoxic effect may be involved. The aim of our study was to evaluate the sensitivity of genotoxicity tests, alkaline elution and micronucleus test, as biomarkers for the detection of heavy metals in mussels as the sentinel species. Experimental studies were carried out on Mytilus galloprovincialis exposed in aquarium (5 days) to different concentrations of three selected metal salts, CuCl2 (5, 10, 20, 40, 80 micrograms/l/a), CdCl2 (1.84, 18.4, 184 micrograms/l/a), and HgCl2 (32 micrograms/l/a), and to a mixture of equimolar doses of the three metals to study the results of their joint action. Metallothionein quantitation was used as a marker of metal exposure. Lysosomal membrane stability was applied to evaluate the influence of physiological status on genotoxic damage. The ranking of genotoxic potential was in decreasing order: Hg > Cu > Cd. Cu and Hg caused an increase of DNA single-strand breaks and micronuclei frequency. Cd induced a statistical increase of DNA damage, but gave negative results with the micronucleus test. A relationship between genotoxic effects and metallothionein content was observed. Reduction in lysosomal membrane stability with the increasing concentration of heavy metals was also evident. Copyright 1999 Wiley-Liss, Inc.

# Title: Environmental Monitoring and Assessment

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Subject Categories:

Environmental Sciences: Impact factor 0.485, 97/126 (1999), Impact Factor 0.839, 63/127 (2000)

? Ajmal, M., Rao, R.A.K. and Siddiqui, B.A. (1995), Adsorption studies and the removal of dissolved metals using pyrolusite as adsorbent. *Environmental Monitoring and Assessment*, **38** (1), 25-35.

Abstract: The adsorption of metals from aqueous solutions of Pb2+, Zn2+ and Mg2+ on naturally occurring pyrolusite have been studied. The chemical stability of the pyrolusite has been determined in NaOH, H2SO4, HNO3, HCl, NaCl and NK4Cl solutions of various concentrations. Adsorption of the metal ions followed the order Pb2+ > Zn2+ > Cd2+. The maximum adsorption of Pb2+ (100%) occurred at pH 7. the relation between the amount of Pb2+ adsorbed per unit weight of pyrolusite and the concentration of Pb2+ at equilibrium follows the Freundlich adsorption isotherm. The efficiency of pyrolusite has been demonstrated by removing lead from synthetic waste water. 100% and 96% removal of lead have been achieved from synthetic waste water containing 5 mg 1-1 and 120 mg 1-1 of Pb2+ respectively at pH 7. The results of these studies suggest that pyrolusite might provide an economical method for the removal of lead from industrial waste water.

Keywords: Competitive Adsorption, Iron Oxyhydroxide, Chromium, Soils, Cu, Zn

Tan, L.C., Choa, V. and Tay, J.H. (1997), The influence of pH on mobility of heavy metals from municipal solid waste incinerator fly ash. *Environmental Monitoring and Assessment*, **44** (1-3), 275-284.

Full Text: [E\Env Mon Ass44, 275.pdf](E/Env%20Mon%20Ass44,%20275.pdf)

Abstract: Incineration has become one of the principal methods for municipal solid waste disposal particularly in all large cities throughout the world. Currently, the municipal solid waste incinerator fly ashes (MSWIF) are disposed of by landfill. The metal speciation of cadmium (Cd), chromium (Ct), copper (Cu), lead (Pb), and zinc (Zn) in MSWIF after been extracted with water at different pH values were examined using a sequential extraction procedure. The extraction sequence was as follows: (1) Exchangeable (NaOAc, pH 8.2), (2) Bound to Carbonates (NaOAc, pH 5.0), (3) Bound to metal oxides (HONH3Cl), (4) Bound to organic matters (HNO3, H2O2), and (5) Residual (HNO3, HCl, H2O2, HF, 1: 3: 1: 3). The heavy metal contents in the extraction solutions were determined by inductively coupled plasma atomic emission spectrometry. The heavy metal concentrations in the different fractions obtained by sequential extraction show distinct distribution trends. The extractable fraction ranges from 25.5 to 88 % of the total element content. With the pH of the extractant fall below the neutral and acidic ranges, the concentrations of heavy metals rise substantially due to the released of metals bound to carbonate fraction.

Koblantz, S.M., Teiger, D.G., Kitto, M.E., Dutkiewicz, V.A., Matuszek, J.M. and Husain, L. (1997), Impact assessment of emissions from a municipal waste incinerator. *Environmental Monitoring and Assessment*, **45** (1), 21-42.

Full Text: [E\Env Mon Ass45, 21.pdf](E/Env%20Mon%20Ass45,%2021.pdf)

Abstract: Emissions from a refuse-derived fuel steam generating plant in downtown Albany, NY, have been a subject of public concern during, and since cessation of, operation of the plant. Aerosol samples routinely collected every sixth day at four air quality monitoring sites (three PM10 and one TSP) in the environs of the plant were analyzed for fourteen trace metals and three combustion-related inorganic anions to detect contributions of the incinerator to the ambient burden in Albany. Statistical and correlative comparisons of the analyte concentrations were made using direct comparison of monthly, quarterly and annual arithmetic and geometric means, enrichment-factor analysis, factor analysis and correlation with wind direction, precipitation and tonnage of refuse burned. These several comparisons reveal that trace-metal and anion concentrations in the fallout of emissions from the plant are extremely low and are indistinguishable from the corresponding ambient concentrations at Albany. Factor analyses and wind-direction correlations indicate that contaminants at Albany were components of mixed air masses with contributions from a variety of regionally distributed sources.

Keywords: Aerosol

Annadurai, G., Chellapandian, M. and Krishnan, M.R.V. (1999), Adsorption of reactive dye on chitin. *Environmental Monitoring and Assessment*, **59** (1), 111-119.

Full Text: [E\Env Mon Ass59, 111.pdf](E/Env%20Mon%20Ass59,%20111.pdf)

Abstract: The adsorption of reactive dye on chitin has been investigated with a view to obtain the design data for batch processing of effluents for dye adsorption. The effect of several factors governing the dye adsorption such as the adsorbent concentration, adsorbent size, temperature and pH have been elicited. Desorption of the dye at different temperatures and pH have also been investigated.

Keywords: Adsorbent Concentration, Adsorbent Size, Adsorption, Chitin, pH, Reactive Dye, Temperature

Zimakowska-Gnoinska, D., Bech, J. and Tobias, F.J. (2000), Assessment of the heavy metal pollution effects on the soil respiration in the Baix Llobregat (Catalonia, NE Spain). *Environmental Monitoring and Assessment*, **61** (2), 301-313.

Full Text: [E\Env Mon Ass61, 301.pdf](E/Env%20Mon%20Ass61,%20301.pdf)

Abstract: A main goal of investigations is to determine could a soil respiration be an indicator of the soil pollution. In this case a measured level of the soil oxygen consumption depends of its pollution. It also means that the pollution reduces biological processes in edaphon. Investigated soil samples were taken from polluted and non-polluted places in the Baix Llobregat near Barcelona (Catalonia, NE Spain). Soil samples were taken from the top of soil (0-5 cm) without a litter. Soil analysis were done, determining percentage shares of coarse fragments, coarse sand, fine sand, coarse silt, fine silt, clay, CaCO3, organic matter as well as water pH and conductivity CE (1: 5 [mS cm-1]). Also were determined (in mg kg-1) quantities of heavy metals, as Fe, Al, Mn, Zn, Cr, Ni, V, Cu, Cd, Pb. The soil respiration was investigated in temperatures 15 and 30°C and with controlled humidity. The respiration in 30°C is number of times greater then in 15°C both for polluted and non-polluted soils. Particularly high coefficients of correlation between the soil respiration and soil pollution in polluted soils were obtained for Pb: r = 0.75 in 15°C and r = 0.98 in 30°C, for Ba: 0.90 and 0.57, for V: 0.99 and 0.81. In non-polluted soils highest correlation coefficients are for Pb: r = 0.70 in 15°C, Fe: 0.60 and 0.72, Al: 0.68 and 0.64, Mn: 0.51 and 0.66, Ba: 0.63 and 0.61, Cr: 0.94 and 0.70, Ni: 0.64 and 0.65, Cu: 0.69 and 0.48, as well as V: 0.62 in 15°C, and Cd: 0.69 in 15°C. This way the soil respiration could be a good indicator of the soil pollution.

Keywords: Biological Activity Ofsoil, Constant-Pressure Volumetric Respirometer, Heavy Metals, Respirometry Methods, Soil, Soil Degradation, Nickel-Copper Smelter, Sudbury, Ontario

Ray, D., Ravindar Rao, R., Bhoi, A.V., Biswas, A.K., Ganguly, A.K. and Sanyal, P.B. (2000), Physico-chemical quality of drinking water in Rohtas district of Bihar. *Environmental Monitoring and Assessment*, **61** (3), 387-398.

Full Text: [E\Env Mon Ass61, 387.pdf](E/Env%20Mon%20Ass61,%20387.pdf)

Abstract: Water Quality Survey of Rohtas district of Bihar was conducted. Samples were collected from different sources and analysed. 209 samples were collected from 196 villages. Results of water quality survey identified the problem areas in respect of high iron, manganese, fluoride, nitrate and brackishness of water in the district.

Keywords: Brackishness, Permissible Limit, Water Quality

Rao, R.A.K., Ajmal, M., Ahmad, R. and Siddiqui, B.A. (2001), Adsorption behaviour of some aromatic amines on pyrolusite and activated carbon and recovery of beta napthylamine from water sample. *Environmental Monitoring and Assessment*, **68** (3), 235-247.

Full Text: [E\Env Mon Ass68, 235.pdf](E/Env%20Mon%20Ass68,%20235.pdf)

Abstract: The adsorption behaviour of Diphenylamine (DPAM), beta napthylamine (beta NAM), alpha napthylamine (alpha NAM) and aniline on pyrolusite and activated carbon has been studied. Pyrolusite shows remarkable sorption capacity for DPAM and beta NAM as compared to aniline, (the adsorption followed the order: µ

Activated Carbon: -> DPAM = beta NAM > alpha Aniline

Pyrolusite: DPAM: -> beta NAM > alpha NAM > Aniline)

The maximum adsorption of beta NAM occurred in the concentration range 4-20 µg mL-1 on pyrolusite (95%) and 4-50 µg mL-µ on activated carbon (100%). The effect of various doses of activated carbon on the adsorption of beta NAM confirm Langmuir and Freundlich isotherms where as Freundlich isotherm is obeyed by pyrolusite. The adsorption of beta NAM on both the absorbents is not affected in presence of DPAM over a wide range of their initial concentrations (20-60 µg mL-1). The desorption studies of beta NAM on pyrolusite was carried out by batch as well as column processes. Excellent results were obtained when a mixture of n-hexane and isopropanol (91: 1) was used as eluent.

Keywords: Activated Carbon, Adsorption, Desorption, Isotherms, Pyrolusite, Separation, Removal, Metals, Waste

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? Kromarek, P. (1984), The Rhine and the MDPA - Repealing of dumping authorization orders. *Environmental Policy and Law*, **12** (1-2), 43-46.

Full Text: [1984\Env Pol Law12, 43.pdf](1984/Env%20Pol%20Law12,%2043.pdf)

# Title: Environmental Pollution

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Allen, S.J., McKay, G. and Khader, K.Y.H. (1988), Multi-component sorption isotherms of basic dyes onto peat. *Environmental Pollution*, **52** (1), 39-53.

Full Text: [E\Env Pol52, 39.pdf](E/Env%20Pol52,%2039.pdf)

Abstract: The adsorption of basic dyes onto peat from single component and multi-component solution is reported. The adsorption is presented in the form of the equilibrium isotherms. The Freundlich, Langmuir and Redlich-Peterson isotherm equations are fitted to the results and the isotherm constants obtained.

Allen, S.J., McKay, G. and Khader, K.Y.H. (1989), Intraparticle diffusion of a basic dye during adsorption onto sphagnum peat. *Environmental Pollution*, **56** (1), 39-50.

Full Text: [E\Env Pol56, 39.pdf](E/Env%20Pol56,%2039.pdf)

Abstract: The adsorption of a basic dye from aqueous solutions onto peat has been examined. Intraparticle diffusion in the peat pore structure is proposed as a mass transfer mechanism. The results indicate a diffusion process in occurring by a macropore and micropore controlled process. A diffusion rate parameter, *k*, is proposed and is correlated with possible system variables.

Han, B.C. and Hung, T.C. (1990), Green oysters caused by copper pollution on the Taiwan coast. *Environmental Pollution*, **65** (4), 347-362.

Full Text: [E\Env Pol65, 347.pdf](E/Env%20Pol65,%20347.pdf)

Abstract: The first case of green oysters (*Crassostrea gigas*) broke out along the Charting mariculture area of south-western Taiwan in January 1986. The green color was found to be due to high copper content in the oyster tissue. Since then, a long-term survey around this area shows that total dissolved copper ranges from 4·99 to 23·6 μg/liter and particulate copper ranges from 1.09 to 5.51 μg/liter in sea-water. The green oysters collected from the Erhjin Chi estuary on 26 January, 1989 gave the highest copper content, 4401±79 ppm dry wt. Other green oyster cases were occasionally observed in the Hsiangsan and Anpin mariculture areas. Meanwhile, an experiment of copper accumulation in oysters was conducted at three stations (south-western Taiwan) for up to 90 days. Multiple regression analysis indicates that the food pathway may predominate in copper accumulation by green oysters. This bioaccumulation experiment shows that the total uptake of copper per oyster is an exponential function of exposure time for the first 2 weeks with an accumulation rate of 214 ppm Cu/day and then levels off. The average values of concentration factors for oysters (about 5×105) were very close to steady-state values under the natural conditions at each station.

McKay, G. and Bino, M.J. (1990), Fixed bed adsorption for the removal of pollutants from water. *Environmental Pollution*, **66** (1), 33-53.

Full Text: [E\Env Pol66, 33.pdf](E/Env%20Pol66,%2033.pdf)

Abstract: The adsorption of phenol, *p*-chlorophenol and mercuric ions from aqueous solution onto activated carbon has been studied in fixed bed columns. The influence of varying parameters such as bed depth, solution flowrate and pollutant concentration has been studied. The Bed Depth Service Time has been used to analyse the experimental data and identify design correlations. Furthermore, an optimization procedure based on the Empty Bed Residence Time has been applied to the data.

Liu, J.Q. and Liu, H.T. (1992), Degradation of azo dyes by algae. *Environmental Pollution*, **75** (3), 273-278.

Full Text: [E\Env Pol75, 273.pdf](E/Env%20Pol75,%20273.pdf)

Abstract: The degradation of azo dyes by algae was evaluated and it was found that certain algae can degrade a number of azo dyes to some extent. The reduction rate appears to be related to the molecular structure of the dyes and the species of algae used. The azo reductase of algae is responsible for degrading azo dyes into aromatic amine by breaking the azo linkage. The aromatic amine is then subjected to further metabolism by algae. It is proposed in this paper that in stabilization ponds, algae can play a direct role in the degradation of azo dyes, rather than only providing oxygen for bacterial growth.

Rajaković, L.V. and Mitrović, M.M. (1992), Arsenic removal from water by chemisorption filters. *Environmental Pollution*, **75** (3), 279-287.

Full Text: [E\Env Pol75, 279.pdf](E/Env%20Pol75,%20279.pdf)

Abstract: The concept of multiple separation by chemisorptive filters was applied and investigated in the process of arsenic removal from water. Chemisorption filters were made by the paper manufacturing method and consisted of cellulose, cationic and anionic ion exchangers, activated carbon and a corresponding chemical agent. In this work chemisorption filters were activated with Ag+, Mg2+, Cu2+, Al3+ and Fe3+ ions, and their chemical contribution to total arsenic removal from the water was analyzed. It was concluded that Cu2+ ions exhibited the best removal effect. Using a chromatographic continuous system with multifunctional filters, which combines the effects of adsorption, ion exchange and filtration, a decrease in the arsenic concentration was determined, for an active layer of 8 mm and a contact time of 2s it was more than 1000-fold. All processes were performed in batch and chromatographic continuous systems under equilibrium or dynamic conditions. The results of the investigations have shown that arsenic removal is valence dependent (the removal of pentavalent arsenic was more effective). The initial concentration, pH and pollutants in anionic forms, which affected the selectivity, were important for all the processes investigated. The mechanisms of pollutant removal were determined on the basis of measurements of active Cu2+ ion propagation inside the filter structure. By correlating the front propagation of active ions and the pollutant output concentration a more exact model for the removal process was obtained.

Keywords: Adsorption, Idaho

Bhargava, D.S. and Sheldarkar, S.B. (1992), Effects of adsorbent dose and size of phosphate-removal from wastwaters. *Environmental Pollution*, **76** (1), 51-60.

Full Text: [E\Env Pol76, 51.pdf](E/Env%20Pol76,%2051.pdf)

Abstract: Laboratory scale production of rinsed tamarind nutshell activated carbon (TNSAC) was done by the method of single stage chemical activation, with zinc chloride as an activation agent. Using this adsorbent, adsorption studies were conducted in agitated batch flow reactors with a fixed initial phosphate concentration and with varying adsorbent particle sizes and doses. The highest percentages adsorbed, for an adsorbent dose of 4 g litre-1, were 57% and 44%, respectively, for adsorbent particle sizes of 106.1 µm and 232.4 µm. Two different models have been developed for predicting the percentage of phosphates adsorbed. Both models manifested high coefficients of correlation, indicating their robustness. The adsorption isotherms developed were observed to resemble the form of Freundlich isotherms. A generalized model has been developed for predicting the adsorptive capacity with respect to the stated test conditions. This model exhibited good coefficients of correlation.

Keywords: Adsorption, Phosphorus, Carbon

Mitchell, D.J., Wild, S.R. and Jones, K.C. (1992), Arrested municipal solid-waste incinerator fly-ash as a source of heavy-metals to the UK environment. *Environmental Pollution*, **76** (1), 79-84.

Full Text: [E\Env Pol76, 79.pdf](E/Env%20Pol76,%2079.pdf)

Abstract: Arrested fly ash samples from most currently operating municipal solid waste (MSW) incinerators in the UK have been analysed for a range of elements. Some of the more important heavy metals ranged in concentration as follows: Cd, 21-4646 (median = 271) mg kg-1, Cu, 296-1307 (642) mg kg-1, Cr, 44-1328 (574) mg kg-1, Ni, 45-2204 (74) mg kg-1, Pb, 447-9704 (4337) mg kg-1, and Zn, 2285-13500 (9232) mg kg-1. These concentrations represent considerable enrichments relative to median UK soil concentrations. Enrichment ratios (defined as median fly ash: median UK soil) were as follows: Mn 1.6, Co 2.6, Ni 3.3, Ba 11, Sr 11, Cr 15, Cu 35, Pb 108, Zn 113, Cd 387. It is estimated that MSW incinerator ash contributes c. 15 t Cd and 241 t Pb to UK landfill sites per annum. These figures compare with previous studies by Hutton & Symon (Hutton, M. & Symon, C. (1986). The quantities of cadmium, lead, mercury and arsenic entering the UK environment from human activities. Sci. Total Environ., 57, 129-50.) which estimated that annual inputs to UK landfills from coal fly ash are c. 60 t Cd and 1270 t Pb. However, it is argued that metals associated with MSW ashes are potentially of greater environmental significance than in coal ashes, because they are much more available and present at much higher concentrations.

Keywords: Refuse Incineration, Trace-Elements, Particles, Cadmium, Lead

Bryan, G.W. and Langston, W.J. (1992), Bioavailability, accumulation and effects of heavy metals in sediments with special reference to United Kingdom estuaries: A review. *Environmental Pollution*, **76** (2), 89-131.

Full Text: [E\Env Pol76, 89.pdf](E/Env%20Pol76,%2089.pdf)

Abstract: Using mainly United Kingdom estuaries as examples, various factors governing the bioavailability, bioaccumulation and biological effects of heavy metals in sediment-dominated estuaries are reviewed. Estuaries and metals primarily discussed include the Mersey (Hg, methylmercury, Pb, alkyllead), the Loughor (Cr, Sn), the Severn (Ag, Cd), the Fal (As, Cu, Sn, Zn), Poole Harbour (Cd, Hg, Se, tributyltin) and Southampton Water (tributyltin).

Concentrations and bioavailabilities of metals in estuarine sediments depend on many different processes. Examples include (1) mobilisation of metals to the interstitial water and their chemical speciation, (2) transformation (e.g. methylation) of metals including As, Hg, Pb and Sn, (3) the control exerted by major sediment components (e.g. oxides of Fe and organics) to which metals are preferentially bound, (4) competition between sediment metals (e.g. Cu and Ag, Zn and Cd) for uptake sites in organisms, and (5) the influence of bioturbation, salinity, redox or pH on these processes.

Under field conditions, identification of dominant processes can be achieved by observing the goodness of fit between metal concentrations in ubiquitous deposit-feeding species and levels in various types of sediment extract over a wide spectrum of sediment types. Factors of more local importance are often indicated by the marked deviation of some points from otherwise excellent relationships. For example, points lying above the line relating tissue Sn concentrations in the clam Scrobicularia plana to those in 1 N HCl extracts of sediments were found to reflect the accumulation of tributyltin, a more readily bioavailable form of Sn. In the same species, unexpectedly high tissue-Cu concentrations were characteristic of very anoxic sediments and tissue As and Pb concentrations were suppressed in sediments having high concentrations of Fe oxides.

Under field conditions, examples of deleterious effects on benthic organisms that can be attributed to specific metallic pollutants are comparatively rare. Effects of tributyltins from antifouling paints on oysters and neogastropods have been documented and their toxicity has undoubtedly led to environmental degradation in many UK estuaries and coastal areas. In estuaries contaminated with metal-mining wastes, the effects of Cu and Zn on species distribution can be observed, but they are generally less obvious than would be predicted from experimental data. Effects are ameliorated by the induction of metal tolerance mechanisms in some species and in others by the appearance of tolerant strains. The induction of metal detoxification systems involving the formation of granules or metal-binding proteins leads in some species to tissue concentrations that are orders of magnitude higher than normal. For example, high concentrations of Cd and Ag have been found in some species from the Severn Estuary, although there is no unequivocal evidence that either metal has caused deleterious effects on benthic populations. On the other hand, experimental studies with Ag, Cd, Cr, Cu, Hg and Zn show that they are toxic to some species at environmentally realistic levels. Since pollutants rarely occur singly, it is likely that in many moderately contaminated estuaries metals contribute to the stress to organisms caused by substances requiring detoxification. There has been much speculation over the years concerning the biomagnification of metals with increasing trophic levels along food chains. Whilst animals having higher metal concentrations than their prey are sometimes found, the only consistent evidence of biomagnification concerns methylmercury.

When estuarine birds are considered, there are relatively few instances in which deleterious effects can unequivocally be attributed to metals or their compounds. However, the Mersey bird kill was attributable to alkyllead pollution from industry. Among other organometals, methylmercury has proved toxic to birds but, so far, no evidence for the toxicity of tributyltin has been reported. However, the compound may have affected bird populations through its effects on the abundance of prey organisms, particularly estuarine molluscs. of the inorganic forms of metals, Pb in the form of shot has caused problems in many areas and Cd, Hg and Se are suspected of causing toxic effects. There is little field evidence that birds have been affected by Ag, As, Cr, Cu or Zn individually. On the other hand, it is difficult to exclude the possibility that, additively, these metals may produce a significant effect. In part, the lack of evidence reflects the fact that relatively little research has been done. There is scope for more work on metals and organometals in estuarine birds, particularly with regard to their metabolism and their effects on juveniles and individuals subjected to stresses such as starvation.

Keywords: Bivalve Scrobicularia-Plana, Polychaete Nereis-Diversicolor, Eelgrass Zostera-Marina, San-Francisco Bay, Neanthes-Arenaceodentata Polychaeta, Amphipod Allorchestes-Compressa, Oyster Crassostrea-Virginica, Gastropod Littorina-Littorea, Diatom Nitzschia-Closterium, Ducks Anas-Platyrhynchos

Ahmed, M.N. and Ram, R.N. (1992), Removal of basic dye from waste-water using silica as adsorbent. *Environmental Pollution*, **77** (1), 79-86.

Full Text: [E\Env Pol77, 79.pdf](E/Env%20Pol77,%2079.pdf)

Abstract: The kinetics of removal of Basic Blue 3 from a textile effluent was studied using silica as an adsorbent. The adsorption was found to follow a first-order process. The influences on the rate of adsorption of various factors, such as temperature, concentration of dye solution, pH of the system and the amount of adsorbent have been investigated. On the basis of the isotherm studies, the various thermodynamical parameters have been calculated. The effect of electrolytes and surfactants has also been seen on the removal of the dye from the waste-water.

Keywords: Equilibrium Adsorption-Isotherms, Aqueous-Solutions, Chrome Dye, Fly-Ash, Effluent, Color, Peat, Sorption

Das, N.C., Padhi, A.K. and Bandyopadhyay, M. (1993), A design of a vermiculite column adsorber for the removal of lead from water. *Environmental Pollution*, **80** (2), 129-132.

Full Text: [E\Env Pol80, 129.pdf](E/Env%20Pol80,%20129.pdf)

Abstract: Mini-column techniques were employed to determine the mass transfer coefficient for lead adsorption onto vermiculite. Variation of the mass transfer coefficient with flow rate, particle size of sorbent, and influent lead concentration were studied. Multiple linear regression (MLR) analysis showed that the mass transfer coefficient varied as the 0.43 power of the liquid flow rate and inversely as the 0.272 power of particle diameter of the vermiculite, but was independent of the influent concentration of lead. Different parameters of a fixed bed column design for the removal of lead by vermiculite were determined using the data from the batch sorption study. The performance of the liquid bed column in removing lead was in close agreement with predicted performance using the batch isotherm data.

Keywords: Adsorption, Column, Fixed Bed, Fixed Bed Column, Fixed Bed Column Design, Fixed-Bed, Flow Rate, Lead, Mass Transfer, Mass Transfer Coefficient, Particle Size, Removal, Sorbent, Sorption

Namasivayam, C. and Ranganathan, K. (1993), Waste Fe(III)/Cr(III) hydroxide as adsorbent for the removal of Cr(VI) from aqueous solution and chromium plating industry wastewater. *Environmental Pollution*, **82** (3), 255-261.

Full Text: [E\Env Pol82, 255.pdf](E/Env%20Pol82,%20255.pdf)

Abstract: Fe(III)/Cr(III) hydroxide, a waste material from the fertilizer industry, has been used for the adsorption of Cr(VI) from aqueous solution, over a range of initial metal ion concentrations (5-30 mg litre-1), agitation times (1-180 min), adsorbent dosages (100-1200 mg per 50 ml), temperatures (24, 29 and 38°C) and pH values (4.5-10). The adsorption of Cr(VI) increased with the initial concentration of Cr(VI) and with temperature. The process of uptake follows both the Langmuir and the Freundlich isotherm models. The applicability of Lagergren and empirical kinetic models has also been investigated. Almost quantitative removal of Cr(VI) at 10 mg litre-1 in a 50-ml solution by 500 mg of adsorbent was found at an equilibrium pH of 5.6. The efficiency of chromium removal was also tested using wastewater from the chromium plating industry.

Keywords: Natural Adsorbents, Acid Dye, Adsorption, Water

Nenov, V., Zouboulis, A.I., Dimitrova, N. and Dobrevsky, I. (1994), As(III) removal from aqueous-solutions using nonstoichiometric coprecipitation with iron(III) sulfate and filtration or flotation. *Environmental Pollution*, **83** (3), 283-289.

Full Text: [E\Env Pol73, 283.pdf](E/Env%20Pol73,%20283.pdf)

Abstract: A study of As(III) removal from aqueous solutions was carried out, using iron(III) sulphate as a coprecipitation agent. When the initial As(III) concentration was 3775 mgl-1, maximum As(III) removal was achieved at pH 9 and with a molar ratio of Fe(III)/As(III) equal to 11. Under these conditions the formed precipitates showed highest stability, relative to the fixation of As(III). Flotation which can be applied as a subsequent solid/liquid separation method, was found to be particularly effective for solutions containing low As(III) concentrations (less than or equal to 10 mg-1).

Keywords: Separation, Germanium

Keller, Th., Matyssek, R. and Günthardt-Georg, M.S. (1994), Beech foliage as a bioindicator of pollution near a waste incinerator. *Environmental Pollution*, **85** (2), 185-189.

Full Text: [E\Env Pol85, 185.pdf](E/Env%20Pol85,%20185.pdf)

Abstract: Since 1971 unshaded leaves from the top of marked beech trees (Fagus sylvatica L.) in the vicinity of a regional waste incinerator have been sampled every year in early September. The unwashed leaf samples were analyzed for the concentration of Cl-and, in some years, for 16 other elements.

The operation of the waste incinerator distinctly increased the Ct concentration in the foliage. When the flue gas filtration did not work properly, several other elements also accumulated (without any obvious dust accumulation). There were no significant correlations between precipitation and concentration of water-soluble elements in foliage samples. This suggested that precipitation was not accelerating foliar leaching so that the bioindication of pollutant accumulation is not restricted in foliage with a well developed cuticula.

Namasivayam, C. and Yamuna, R.T. (1995), Adsorption of Direct red 12B by biogas residual slurry: Equilibrium and rate processes. *Environmental Pollution*, **89** (1), 1-7.

Full Text: [E\Env Pol89, 1.pdf](E/Env%20Pol89,%201.pdf)

Abstract: The rate of adsorption of Direct red 12B, a direct dye, on biogas residual slurry (BRS) has been studied. The parameters studied include dye concentration, particle size, temperature and pH. The rate controlling step is mainly intraparticle diffusion, although a small boundary layer resistance is expressed. Almost total removal of dye occurred at pH 23. Adsorption of dye conforms with the Freundlich isotherm.

Hernández, J.E.G., del Pino, J.S.N., Martín, M.M.G., Díaz, R.D. and González, E.J.F. (1995), Natural phillipsite as a matrix for a slow-release formulation of oxamyl. *Environmental Pollution*, **88** (3), 355-359.

Full Text: [E\Env Pol88, 355.pdf](E/Env%20Pol88,%20355.pdf)

Abstract: The performance of phillipsite as a matrix for slow-release formulation of oxamyl [*N,N*-dimethyl-2-methylcarbamoyl-oxymino-2-(methylthio)acetamide] was tested. The adsorption kinetics followed a first-order law, and the adsorption isotherm fitted well in a two-surface Langmuir model, suggesting a double mechanism of interaction between oxamyl and the sorbent. The sorption mechanism, studied by FTIR, provided two fractions of oxamyl. The first one is sorbed on the mineral surface, linked by H-bonding, and the second one is constituted by a multilayer of oxamyl molecules linked by a water bridge between them. The release kinetics of oxamyl from a substratum zeolite-oxamyl also follows a first-order law, with two stages that correspond to both fractions of oxamyl previously detected.

Keywords: Adsorption Isotherms, Adsorption Phenomena, Groundwater, Langmuir Equation, Oxamyl, Phillipsite, Release Kinetics, Sorption, Two-Surface Langmuir

Zimmerling, R., Dämmgen, U., Küsters, A., Grünhage, L. and Jäger, H.J. (1996), Response of a grassland ecosystem to air pollutants. IV. The chemical climate: Concentrations of relevant non-criteria pollutants (trace gases and aerosols). *Environmental Pollution*, **91** (1), 139-147.

Full Text: [E\Env Pol91, 139.pdf](E/Env%20Pol91,%20139.pdf)

Abstract: The concentrations of sulphur dioxide, nitric acid, nitrous acid, hydrogen chloride, ammonia and sulphate, nitrate, chloride and ammonium in aerosols were measured continuously for two years at the rural site of Rotenkamp near Braunschweig in south-east Lower Saxony. The level of air pollution registered is typical for rural areas near industrial areas in Central Europe. Long-range transport of polluted air masses from Saxony-Anhalt and Saxony affects air quality when high-pressure areas over Eastern Europe result in easterly winds and reduced vertical exchange due to low inversion layers.

Watmough, S.A. and Hutchinson, T.C. (1996), Analysis of tree rings using inductively coupled plasma mass spectrometry to record fluctuations in a metal pollution episode. *Environmental Pollution*, **93** (1), 93-102.

Full Text: [E\Env Pol93, 93.pdf](E/Env%20Pol93,%2093.pdf)

Abstract: Analysis of Acer pseudoplatanus L. (sycamore) tree rings using ICP-MS was used to assess the impact of metal deposition on trees growing in the vicinity of a metal refinery at Prescot, north-west England compared to a reference site at Croxteth 6 km distant receiving minimal deposition. No difference in tree growth between sites was recorded. Large reductions in Cu and Cd deposition since the late 1970s was accompanied by a steep decline in Cd concentrations in the outer rings in trees close to the refinery. A similar reduction in Cu concentrations was less apparent due to a tendency for Cu to increase in the outer rings. Zinc and Ni were higher in xylem at Prescot compared to Croxteth. There was no trend in Zn concentrations at either site although Ni concentrations increased in trees close to the refinery after 1982. Manganese concentrations in xylem were much higher at Prescot, Mn levels declined until the late 1970s and then increased slightly in later years interspersed by large concentration peaks within individual years during the 1980s. There was little change in Mn concentrations in trees at Croxteth during this period, Calcium, Mg and Sr concentrations remained steady or declined slightly in rings formed since 1965 in trees at Croxteth. Concentrations of Ca, Mg and Sr were higher in rings formed prior to the mid 1970s in trees at Prescot, but declined steadily after this period, although peaks in concentrations of each element were recorded in individual years during the 1980s. Phosphorous concentrations in rings increased towards the cambium at Croxteth, although P levels decreased in rings formed after 1982 at Prescot. No difference in K concentrations between sites was recorded. Lead concentrations in xylem at both sites declined steadily in rings formed after 1970, although concentrations were higher at the reference site. Analysis of individual sycamore tree rings appears to record short-term changes in pollution episodes, with little lateral movement of elements occurring. It is suggested that changes in element concentrations in trees close to the refinery ave a result of reduced metal deposition combined with increased soil acidity due to reduced buffering capacity of metal ions in rainfall.

Chen, T.B., Wong, J.W.C., Zhou, H.Y. and Wong, M.H. (1997), Assessment of trace metal distribution and contamination in surface soils of Hong Kong. *Environmental Pollution*, **96** (1), 61-68.

Full Text: [E\Env Pol96, 61.pdf](E/Env%20Pol96,%2061.pdf)

Abstract: An intensive investigation was conducted to study the distribution of trace metals in surface soils of Hong Kong and to assess the soil environmental quality. From results of cluster analysis and comparisons among soil types and areas, it is clearly shown that increases in trace metal concentrations in the soils were generally extensive and obvious in urban and orchard soils, less so in vegetable soils, whilst rural and forest soils were subjected to the least impact of anthropogenic sources of trace metals. However, some of the forest soils also contained elevated levels of As, Cu and Pb. Urban soils in Hong Kong were heavily polluted by Pb from gasoline combustion. Agricultural soils, both orchard and vegetable soils, usually accumulated As, Cd, Cu and Zn originating from applications of pesticides, animal manures and fertilizers. In general, trace metal pollution in soils of the industrial areas and Pb pollution in the soils of the commercial and residential areas were obvious.

Davies, N.A., Taylor, M.G. and Simkiss, K. (1997), The influence of particle surface characteristics on pollutant metal uptake by cells. *Environmental Pollution*, **96** (2), 179-184.

Full Text: [E\Env Pol96, 179.pdf](E/Env%20Pol96,%20179.pdf)

Abstract: The phosphatic mineral, hydroxyapatite, and two ion exchange resins have been used as artificial sediment particles. The surface properties of these materials have been studied using the Langmuir adsorption isotherm to calculate the binding capacity (B-max) and the adsorption constant (KL) for zinc and cadmium ions. Mussels (Mytilus edulis) were fed on the particles and their digestive glands were subsequently removed and subjected to cell fractionation. The supernatant fraction was used to determine cytosol metal levels as a measure of the materials absorbed from the ingested particles. The level of cytosol zinc and cadmium was correlated with the KL values of the artificial sediments. It is suggested that phagocytosis of sediment particles plays an important part in transferring pollutants into benthic organisms and that the efficiency of this process is related to the adsorption coefficient of the particle surfaces. (C) 1997 Elsevier Science Ltd.

Keywords: Adsorption Constant, Metals, Pollution, Endocytosis, Particle Surfaces, Adsorption, Bivalves, Seawater

Özer, A., Altundoğan, H.S., Erdem, M. and Tümen, F. (1997), A study on the Cr(VI) removal from aqueous solutions by steel wool. *Environmental Pollution*, **97** (1-2), 107-112.

Full Text: [E\Env Pol97, 107.pdf](E/Env%20Pol97,%20107.pdf)

Abstract: The reduction of Cr(VI) by steel wool and the precipitation of reduced chromium by CaCO3 powder and NaOH solution were investigated in continuous and batch systems, respectively. The effects of acid and initial Cr(VI) concentrations, volumetric sate and temperature of solution on Cr(VI) reduction were studied. The results showed that the reduction of Cr(VI), to a large extent, depended on, and increased with, acid concentration. The Cr(III) and iron ions in the reduced solution were completely precipitated by using NaOH solution at appropriate alkaline conditions. If was concluded that CaCO3 powder could be used as a cheap precipitant for Cr(III) ions. But the iron ions in the reduced solution could not be fully removed by using this precipitant. (C) 1997 Elsevier Science Ltd.

Keywords: Steel Wool, Hexavalent Chromium, Reduction, Precipitation

Kleiman, I.D. and Cogliatti, D.H. (1997), Uptake of chromate in sulfate deprived wheat plants. *Environmental Pollution*, **97** (1-2), 131-135.

Full Text: [E\Env Pol97, 131.pdf](E/Env%20Pol97,%20131.pdf)

Abstract: Terrestrial plants have been proposed for the removal of chromate from waste waters. Since chromate seems to be absorbed in roots by the same transport system as sulfate, sulfate-deprivation pretreatment and sulfate absence during chromate uptake were tested in wheat in order to increase chromium uptake efficiency. At 1 and 5 µg CrO42- ml-1 the highest chromate uptake was observed when plants suffered 5 days of sulfate deprivation pretreatment and absence of sulfate during chromate uptake. However, only at the lower concentration chromate net uptake was rapidly replaced by net efflux presumably due to toxic effects. At 5 µg CrO42- ml-1, the uptake of chromate was also enhanced by sulfate-deprivation pretreatment alone or lack of sulfate-competition. We conclude that sulfate is a strong inhibitor of chromate uptake, and when plants are going to be used to remove chromate from waste waters, sulfate-chromate interaction should be considered.

Keywords: Bioremediation, Chromate Uptake, Chromate-Sulfate, Waste Waters, Terrestrial Plants

? Venkata Mohan, S. and Karthikeyan, J. (1997), Removal of lignin and tannin colour from aqueous solution by adsorption onto activated charcoal. *Environmental Pollution*, **97** (1-2), 183-187.

Full Text: [1997\Env Pol97, 183.pdf](1997/Env%20Pol97,%20183.pdf)

Abstract: Sorptive uptake of lignin and tannin from an aqueous phase by activated charcoal was investigated in the laboratory. The sorption reaction was found to be of a first order. The influence on the rate of sorption of various factors, such as amount of sorbent and pH of the system, have been investigated. Sorption data fit well into the Langmuir adsorption isotherm, indicating formation of a monolayer over a homogeneous sorbent surface. Sorption capacity, rate constant, intraparticle diffusion coefficient, etc. were calculated from the sorption data. Desorption studies indicate the irreversible nature of the sorption reaction, whereas interruption studies suggest film diffusion to be rate limiting. (C) 1997 Elsevier Science Ltd.

Keywords: Silica, Water

Matis, K.A., Zouboulis, A.I., Malamas, F.B., Afonso, M.D.R. and Hudson, M.J. (1997), Flotation removal of As(V) onto goethite. *Environmental Pollution*, **97** (3), 239-245.

Full Text: [E\Env Pol97, 239.pdf](E/Env%20Pol97,%20239.pdf)

Abstract: Arsenic oxyanions, considered as priority pollutants, were removed from dilute aqueous solutions by sorption onto synthetic goethite, a typical inorganic adsorbent. Flotation was subsequently applied as an effective solid/liquid separation method. The combined process produced a foam concentrate, containing the arsenic-loaded goethite particles. The dispersed-air flotation technique was used for the generation of fine gas bubbles. The main parameters affecting the process were studied and promising results, in terms of arsenic removal and of goethite separation, were obtained. (C) 1997 Elsevier Science Ltd.

Keywords: Arsenate, Goethite, Sorption, Flotation, Water Treatment, Adsorbing Colloid Flotation, Adsorption, Surface, Molybdate, Arsenate

Xiong, Z.T. (1997), Bioaccumulation and physiological effects of excess lead in a roadside pioneer species Sonchus oleraceus L. *Environmental Pollution*, **97** (3), 275-279.

Full Text: [E\Env Pol97, 275.pdf](E/Env%20Pol97,%20275.pdf)

Abstract: Seedlings of Sonchus oleraceus L. were transplanted to soil supplied with lead acetate at dosages of 0, 800, 1600 and 3200 mg kg−1 DW. Measures of chlorophyll content, peroxidase (POD) activity, shoot length, biomass and Pb content in the plant tissues were obtained from the experimental plants. With increasing amounts of Pb in the soil, the chlorophyll content, shoot length and biomass decreased, while POD activity and Pb content in the plant tissues increased. At 3200 mg kg−1 Pb treatment, Pb content in the plant leaf, stem and root were 65.67, 149.82 and 1113.24 mg kg−1, respectively. Only at 3200 mg kg−1 Pb treatment did chlorophyll content, shoot length and biomass significantly increase by 18, 15 and 44%, respectively, while POD decreased by 39% over the control. The potential of applying this species in phytoremediation of Pb contaminated roadside soils and thus restoration of the roadside vegetation are discussed.

Keywords: Lead, Bioaccumulation, Physiological Effects, Sonchus Oleraceus

Dictor, M.C., Battaglia-Brunet, F., Morin, D., Bories, A. and Clarens, M. (1997), Biological treatment of gold ore cyanidation wastewater in fixed bed reactors. *Environmental Pollution*, **97** (3), 287-294.

Full Text: [E\Env Pol97, 287.pdf](E/Env%20Pol97,%20287.pdf)

Abstract: The treatment of a cyanidation effluent containing thiocyanate, free cyanide, and complexed cyanide was continuously performed for a period of 6 months. Activated carbon, pozzolana, and a mixture of pumice stone and zeolite were tested as supports in fixed bed reactors. Activated carbon adsorbed the different forms of cyanide. In contrast, the other supports did not remove any pollutants from the effluent during an adsorption experiment. All supports successfully allowed fixation of bacteria. More than 90% of the thiocyanate was biologically decomposed into NH4+, CO2 and SO42-, even when increasing the feed flow-rate and the pollutant concentrations. Free and complexed cyanides were eliminated, probably through a combination of precipitation and biological degradation. The oxidation of ammonium into nitrate was only performed by the activated carbon-containing column and with the more diluted feeding. The nitrification process was inhibited in all reactors when the cyanide concentrations and feed flow-rates were increased.

Keywords: Degradation, Thiocyanate, Ammonia, Carbon, Thiocyanate, Cyanide, Fixed Bed, Support, Nitrification

Walker, G.M. and Weatherley, L.R. (1998), Fixed bed adsorption of acid dyes onto activated carbon. *Environmental Pollution*, **99** (1), 133-136.

Full Text: [E\Env Pol99, 133.pdf](E/Env%20Pol99,%20133.pdf)

Abstract: The context of the study here is the adsorption of acid dyes from wastewater arising from a nylon carpet printing plant which currently receives no treatment. Since nylon is a particularly difficult fibre to dye, acid dyes are required for successful coloration. However, their presence, in high concentrations, in aqueous effluent arising from the plant can create major problems with respect to disposal. A treatment method based on adsorption onto granular activated carbon (GAC F400) in a fixed column configuration is described and breakthrough data of the dyes determined. The breakthrough data were correlated using a model based on liquid and pore diffusion with a good fit of experimental results obtained. Trends in the effective diffusivity used in the model correlated with other authors. A slight decrease in effective diffusivity was found with decrease in particle size and was attributed to interactions between the relatively large molecular sized dye and the microspore structure found in granular activated carbon.

Keywords: Water-Purification, Batch Tests, Scale-Up, Columns

Srimurali, M., Pragathi, A. and Karthikeyan, J. (1998), A study on removal of fluorides from drinking water by adsorption onto low-cost materials. *Environmental Pollution*, **99** (2), 285-289.

Full Text: [E\Env Pol99, 285.pdf](E/Env%20Pol99,%20285.pdf)

Abstract: Various low-cost materials like kaolinite, bentonite, charfines, lignite and nirmali seeds were investigated to assess their capacity for removal of fluorides from water by batch adsorption studies. Studies were also conducted to determine optimum operating-system parameters, such as contact time, pH, dose and size of the adsorbent. Present study has indicated that materials like nirmali seeds and lignite are not effective (removal 6 to 8%), whereas removal by kaolinite clay was slightly higher (18.2%). Charfines and bentonite exhibited highest removal capacity of 38 and 46%, respectively, at optimum system conditions. Chemical pre-treatment of charfines did not result in enhanced removal of fluoride from water. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Fluorides, Removal, Adsorption, Low-Cost Materials, Bentonite, Charfines

Bussotti, F. and Ferretti, M. (1998), Air pollution, forest condition and forest decline in Southern Europe: An overview. *Environmental Pollution*, **101** (1), 49-65.

Full Text: [E\Env Pol101, 49.pdf](E/Env%20Pol101,%2049.pdf)

Abstract: Over the last decades much of the work on the impact of air pollution on forests in Europe has concentrated on central and northern countries. The southern part of Europe has received far less attention, although air pollutants-especially the photochemical ones-can reach concentrations likely to have adverse effects on forest vegetation. Although international forest condition surveys present serious problems where data consistency is concerned, they reveal considerable year-by-year species-specific fluctuations rather than a large-scale forest decline. Cases of obvious decline related to environmental factors are well circumscribed: (1) the deterioration of some coastal forests due to the action of polluted seaspray, (2) the deterioration of reforestation projects, especially conifers, mainly due to the poor ecological compatibility between species and site, and (3) the decline of deciduous oaks in southern Italy and of evergreen oaks in the Iberian peninsula apparently due to the interaction of climate stresses and pests and diseases. However, besides obvious deterioration, changes in environmental factors can provoke situations of more subtle stress. The most sensitive stands are Mediterranean conifer forests and mesophile forests of the Mediterranean-montane plane growing at the edges of the natural ecological distribution. Evergreen sclerophyllous forests appear less sensitive to variations in climatic parameters, since they can adapt quite well to both drought and the action of UV-B rays. Several experiments were carried out to test the sensitivity of Mediterranean forest species to air pollutants. Most of those experiments used seedlings of different species treated with pollutant concentrations too high to be realistic, so it is difficult to derive adequate information on the response of adult trees in field conditions. Ozone has been proved to cause foliar injury in a variety of native forest species in different Southern European countries, while the effects of other pollutants (e.g. nitrogen, sulphur, acidic deposition) are less obvious and likely to be very localized. In the case of ozone, visible symptoms were almost completely missed by large-scale surveys and-at the same time-non-visible symptoms are suspected to be even more widespread than the visible ones. Owing to this and to the complex relationships existing between species sensitivity, ozone exposure and doses, length of the vegetative periods, influence of climatic and edaphic condition on the tree’s response, the impacted areas are yet to be identified. Therefore, the large-scale impact of air pollutants on the forests of Southern Europe remains largely unknown, until more specific investigations are carried out. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Forest Conditions, Forest Decline, Mediterranean Region, Ozone, Pollution Climate, Pinus-Halepensis Mill, Simulated Acid-Rain, Fagus-Sylvatica L, Abies-Alba Mill, Quercus-Ilex L, Oak Decline, Different Provenances, Photochemical Ozone, Coastal Vegetation, Nutritional-Status

Zhou, J.L., Huang, P.L. and Lin, R.G. (1998), Sorption and desorption of Cu and Cd by macroalgae and microalgae. *Environmental Pollution*, **101** (1), 67-75.

Full Text: [E\Env Pol101, 67.pdf](E/Env%20Pol101,%2067.pdf)

Abstract: The sorption and desorption of Cu and Cd by two species of brown macroalgae and five species of microalgae were studied. The two brown macroalgae, *Laminaria japonica* and *Sargassum kjellmanianum*, were found to have high capacities at pHs between 4.0 and 5.0 while for microalgae, optimum pH lay at 6.7. The presence of other cations in solution was found to reduce the sorption of the target cation, suggesting a competition for sorption sites on organisms. Sorption isotherms obeyed the Freundlich equation, suggesting involvement of a multiplicity of mechanisms and sorption sites. For the microalgae tested, *Spirulina platensis* had the highest capacity for Cd, followed by *Nannochloropsis oculata*, *Phaeodactylum tricornutum*, *Platymonas cordifolia* and *Chaetoceros minutissimus*. The reversibility of metal sorption by macroalgae was examined and the results show that both HCl and EDTA solutions were very effective in desorbing sorbed metal ions from macroalgae, with up to 99.5% of metals being recovered. The regenerated biomass showed undiminished sorption performance for the two metals studied, suggesting the potential of such material for use in water and wastewater treatment. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Biosorption, Macroalgae, Microalgae, Copper, Cadmium

Echeverría, J.C., Morera, M.T., Mazkiarán, C. and Garrido, J.J. (1998), Competitive sorption of heavy metal by soils. Isotherms and fractional factorial experiments. *Environmental Pollution*, **101** (2), 275-284.

Full Text: [E\Env Pol101, 275.pdf](E/Env%20Pol101,%20275.pdf)

Abstract: Competing ions strongly affect heavy metal sorption onto the solid surfaces of soil. This study evaluated competitive sorption of Cd, Cu, Ni, Pb and Zn on three soils: Calcixerollic Xerochrept, Paralithic Xerorthent and Lithic Haplumbrept. Monometal and competitive sorption isotherms were obtained at 25°C. The individual effect of ions on retention of the others was ascertained by a fractional factorial analysis design. Most of the sorption isotherms belonged to type L subtype 2 in the classification of Giles. In competitive sorption the initial linear part was shorter and the knee sharper when compared with monometal sorption isotherms. Parameters related to sorptive capacity, such as Point B, Langmuir monolayer and Freundlich distribution coefficient, were higher in monometal than in competitive sorption, and in basic soils than in acidic soil. Calcium desorbed at different points of the sorption isotherms indicated that cationic exchange with Ca was the main retention mechanism in calcareous soils. For Pb, the ratio Ca desorbed/Pb sorbed was close to one, for Cu, Ni and Zn the ratio ranged from 1.20 to 1.37, probably due to partial dissolution of calcium carbonates by hydrolytic processes during retention. On the other hand, Cd had a ratio around 0.6 reflecting another additional retention mechanism, probably surface complexation. Fractional factorial design confirmed that the presence of the cations investigated reduced the amount of the five metals retained, but the presence of Cu and Pb in the system depressed Ni, Cd and Zn sorption more than the inverse. Cation mobility was enhanced when equilibrium concentration increased and the effect was higher in Ca-saturated soils. (C) 1998 Elsevier Science Ltd. All rights reserved.

Keywords: Competitive Sorption, Heavy Metals, Soil, Isotherm, Factorial Experiments

Kefala, M.I., Zouboulis, A.I. and Matis, K.A. (1999), Biosorption of cadmium ions by *Actinomycetes* and separation by flotation. *Environmental Pollution*, **104** (2), 283-293.

Full Text: [E\Env Pol104, 283.pdf](E/Env%20Pol104,%20283.pdf)

Abstract: Among the most important parameters which have to be examined, when treated waste waters are going to be recycled, is their content of toxic metals, due to ever decreasing metal disposal limits. For this reason, the examination of effective and innovate waste water treatment methods becomes an important need. The removal of cadmium, a toxic metal of high environmental priority due to its toxicity, from dilute aqueous solutions has been studied in the present work, applying microorganisms and using living, as well as non-living bacterial biomass of two specially isolated *Actinomycetes* strains, AK61 and JL322. The main parameters influencing this treatment process, namely contact time, pH of the solution, temperature and toxic metal and biomass concentrations have been examined and Langmuir isotherms have been depicted. Dispersed-air flotation was applied as the subsequent separation method for harvesting the suspended metal-laden microorganisms, following the biosorption of cadmium. The investigated parameters (in batch mode, laboratory scale) were in this case the dispersion pH, the flotation time, the air flowrate and the surfactant concentration. Electrokinetic measurements have been also performed for the biomass dispersions, under similar conditions with biosorption, providing useful information for the process mechanisms. Applying the optimum defined conditions, over 95% removal of cadmium has been achieved in one stage and simultaneously, quantitative separation of the used (metal-loaded) biomass has been obtained. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Actinomycetes, Biosorption, Bioaccumulation, Biomass, Cadmium, Flotation, Zeta-Potential

Prakasham, R.S., Merrie, J.S., Sheela, R., Saswathi, N. and Ramakrishna, S.V. (1999), Biosorption of chromium VI by free and immobilized *Rhizopus arrhizus*. *Environmental Pollution*, **104** (3), 421-427.

Full Text: [E\Env Pol104, 421.pdf](E/Env%20Pol104,%20421.pdf)

Abstract: Biosorption of chromium(VI) was studied by using non-living free and immobilized biomass of *Rhizopus arrhizus* at pH 2. A biphasic chromium adsorption pattern was observed in all experimental conditions. Chromium removal rate was slightly more in free biomass conditions over immobilized state. Stirred tank reactor studies indicated maximum chromium biosorption at 100 rpm and at 1: 10 biomass-liquid ratio. Fluidized bed reactor is more efficient in chromium removal over stirred tank reactor. Immobilization of biomaterial has a little effect on chromium biosorption by this R. arrhizus biomass.

Keywords: Heavy-Metals, Biomass, Algae, Accumulation, Microalgae, Removal, Bioremediation, Biosorption, Chromium, Heavy Metal, *Rhizopus arrhizus*, Wastewater Treatment

Gibbons, J. and Laha, S. (1999), Water purification systems: A comparative analysis based on the occurrence of disinfection by-products. *Environmental Pollution*, **106** (3), 425-428.

Full Text: [E\Env Pol106, 425.pdf](E/Env%20Pol106,%20425.pdf)

Abstract: Trihalomethanes (THMs) are halogenated hydrocarbons, and are by-products of the chlorination of drinking water. Most THMs are formed in drinking water when chlorine reacts with naturally occurring organic substances such as decomposing plant and animal materials. Risks for certain types of cancer are now being correlated with the presence of disinfection by-products (DBPs). The present research uses gas chromatography to analyze the presence and levels of THMs in drinking water samples from a variety of sources. These include (1) municipal drinking water from two south Florida counties (2) two brands of bottled water, (3) untreated residential well water, and (4) municipal tap water passed through additional water purification systems. The results are summarized in a tabular format, and the compliance of each water with existing US EPA-mandated standards is examined. General conclusions from this study are that all the waters tested complied with federal regulations regarding THM levels, properly functioning home filtration units may be quite effective in further reducing DBP concentrations and, as expected, non-chlorinated waters such as bottled water and residential well water contain lower THM levels. (C) 1999 Elsevier Science Ltd. All rights reserved.

Keywords: Water Purification Systems, Disinfection By-Products, Trihalomethanes, Drinking-Water, Trihalomethanes, Chlorination

Langwaldt, J.H. and Puhakka, J.A. (2000), On-site biological remediation of contaminated groundwater: A review. *Environmental Pollution*, **107** (2), 187-197.

Full Text: [E\Env Pol107, 187.pdf](E/Env%20Pol107,%20187.pdf)

Abstract: On-site biological treatment has been used for groundwater cleanup from industrial and agricultural chemicals. The pump- and-treat efficiency is controlled by retardation of contaminants by sorption onto the saturated subsurface solids and by the presence of non-aqueous-phase liquids in the aquifer. On-site bioreactors have been widely used for treatment of contaminants such as petroleum hydrocarbons, monoaromatic hydrocarbons, chlorinated aliphatics and aromatics. The most commonly used reactor types for groundwater include the following: trickling filter, upflow fixed-film reactor and fluidized bed reactor. Bioreactor processes have limitations mainly because of their design to operate at elevated temperatures and thereby by high operational costs. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Activated Carbon, Anaerobic Degradation, Aromatic-Hydrocarbons, Biodegradation, Biodegradation, Bioreactor, Bioremediation, Bioremediation, Contamination, Fixed-Film Reactors, Fluidized-Bed Reactors, Groundwater, On-Site Treatment, Organic-Compounds, Toluene, Wastewater-Treatment

Notes: highly cited

Banat, F.A., Al-Bashir, B., Al-Asheh, S. and Hayajneh, O. (2000), Adsorption of phenol by bentonite. *Environmental Pollution*, **107** (3), 391-398.

Full Text: [E\Env Pol107, 391.pdf](E/Env%20Pol107,%20391.pdf)

Abstract: The potential of bentonite for phenol adsorption from aqueous solutions was studied. Batch kinetics and isotherm studies were carried our to evaluate the effect of contact time, initial concentration, pH, presence of solvent, and the desorption characteristics of bentonite. The adsorption of phenol increases with increasing initial phenol concentration and decreases with increasing the solution pH value. The adsorption process was significantly influenced by the solvent type in which phenol was dissolved. The affinity of phenol to bentonite in the presence of cyclohexane was greater than that in water and was lowest in the presence of methanol. Methanol was used to extract phenol from bentonite. The degree of extraction was dependent on the amount of phenol adsorbed by bentonite. X-ray diffraction analysis showed that the crystalline structure of bentonite was destroyed when cyclohexane was used. The ability of bentonite to adsorb phenol from cyclohexane decreased as the water to cyclohexane ratio was increased. Furthermore, hysteresis was observed in phenol desorption from bentonite in aqueous solutions. The equilibrium data in aqueous solutions was well represented by the Langmuir and Freundlich isotherm models. The removal of phenol from aqueous solutions was observed without surface modification. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Bentonite, Phenol, Adsorption, Desorption, X-Ray Diffraction, Activated Carbon, Aqueous-Solutions, Desorption Characteristics, Solvent Regeneration, Organic Pollutants, Natural Bentonite, Waste-Water, Removal, Montmorillonite, Adsorbents

Cornelissen, G., Hassell, K.A., van Noort, P.C.M., Kraaij, R., van Ekeren, P.J., Dijkema, C., de Jager, P.A. and Govers, H.A.J. (2000), Slow desorption of PCBs and chlorobenzenes from soils and sediments: Relations with sorbent and sorbate characteristics. *Environmental Pollution*, **108** (1), 69-80.

Full Text: [E\Env Pol108, 69.pdf](E/Env%20Pol108,%2069.pdf)

Abstract: The kinetics of slow desorption were studied for four soils and four sediments with widely varying characteristics [organic carbon (OC) content 0.5-50%, organic matter (OM) aromatic content (7-37%)] for three chlorobenzenes and five polychlorinated biphenyls (PCBs). Slowly and very slowly desorbing fractions ranged from 1 to 50% (slow) and 3 to 40% (very slow) of the total amount sorbed, and were observed for all compounds and all soils and sediments. In spite of the wide variations in sorbate KOW (factor 1000) and sorbent characteristics, the rate constants of slow (kslow, around 10-3 h-1) and very slow (kvery slow 10-5-10-4 h-1) desorption appeared to be rather constant among the sorbates and sorbents (both within a factor of 5). There was a good correlation (r2 above 0.9) between the distribution over the slow, very slow and rapid sediment fractions and log KOC, indicating that sorbate hydrophobicity may be important for this distribution. No correlation could be found between sorbent characteristics [OC, N, and O in the organic matter, polarity index C/(N + O), OC aromaticity as determined by CP-MAS C-13-NMR] and slow desorption parameters (slowly/very slowly desorbing fractions + corresponding rate constants). The absence of (I) a correlation between k(slow) and k(very slow), respectively, and OC content, and (2) the narrow range of k(slow) and k(very slow) values, indicates that intra-OM diffusion is not the mechanism of slow or very slow desorption, because on the basis of this mechanism it would be expected that increasing OC content would lead to longer diffusion pathlengths and, consequently, to smaller rate constants. In addition, it was tested whether differential scanning calorimetry would reveal a glass transition in the soils/sediments. In spite of the sensitivity of the equipment used (changes in heat flow in the micro-Watt range were measurable), a glass transition was not observed. This means that activation enthalpies of slow desorption can be calculated from desorption measurements at various temperatures. In the present study these values ranged from 60 to 100 kJ/mol among the various soils and sediments studied. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: PCBs, Chlorobenzenes, Desorption, Soils, Sediments, Sorbent/Sorbate Characteristics, Distributed Reactivity Model, Polycyclic Aromatic-Hydrocarbons, Organic-Compounds, Polychlorinated-Biphenyls, Nonequilibrium Sorption, Aquifer Material, Alpha-Naphthol, Partition, Kinetics, Polarity

Notes: highly cited

? Reid, B.J., Jones, K.C. and Semple, K.T. (2000), Bioavailability of persistent organic pollutants in soils and sediments: A perspective on mechanisms, consequences and assessment. *Environmental Pollution*, **108** (1), 103-112.

Full Text: [2000\Env Pol108, 103.pdf](2000/Env%20Pol108,%20103.pdf)

Abstract: It has been observed that as soil-pollutant contact time increases, pollutant bioavailability and extractability decreases. This phenomenon has been termed ‘ageing’. Decreased chemical extractability with increased soil-chemical contact time is evident where both ‘harsh’ techniques, e.g. dichloromethane Soxhlet extraction, and ‘non-exhaustive’ techniques, e.g. butanol shake extraction, have been used. It has also been observed that the amount of chemical extracted by these techniques varies considerably over time. Similarly, decreases in bioavailability with increased soil-pollutant contact time have been described in bacterial, earthworm and other organism studies. From these investigations, it has been shown that the fraction of pollutant determined to be bioavailable can vary between organisms. Thus, there is an immediate definition problem, what is bioavailability? Additionally, if bioavailability is to be assessed by a chemical means, which organisms should (or can) be mimicked by the extraction procedure? This review provides a background to the processes inherent to ageing, a discussion of its consequences on bioavailability and ends with some reflections on the appropriateness of chemical extraction techniques to mimic bioavailability (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Bioavailability, Contaminated Soils, Desorption-Kinetics, Digestive Fluid Extraction, Lux-Modified Bacterial, Mass-Transfer Limitation, Oligochaete Lumbriculus-Variegatus, Persistent Organic Pollutants, Polychlorinated-Biphenyls, Polycyclic Aromatic-Hydrocarbons, Pseudomonas-Fluorescens, Sediments, Soils, Sorption Kinetics

Walker, G.M. and Weatherley, L.R. (2000), Biodegradation and biosorption of acid anthraquinone dye. *Environmental Pollution*, **108** (2), 219-223.

Full Text: [E\Env Pol108, 219.pdf](E/Env%20Pol108,%20219.pdf)

Abstract The acid anthraquinone dye Tectilon Blue (TB4R) is a major coloured component from the aqueous effluent of a carpet printing plant in Northern Ireland. The aerobic biodegradation of TB4R has been investigated experimentally in batch systems, using three strains of bacteria, namely, Bacillus gordonae (NCIMB 12553), Bacillus benzeovorans (NCIMB 12555) and Pseudomonas putida (NCIMB 9776). All three strains successfully decolourised the dye, and results were correlated using Michaelis–Menten kinetic theory. A recalculation of the reaction rate constants, to account for biosorption, gave an accurate simulation of the colour removal over a 24-h period. Up to 19% of the decolorisation was found to be caused by biosorption of the dye onto the biomass, with the majority of the decolorisation caused by utilisation of the dye by the bacteria. The reaction rate was found to be intermediate between zero and first order at dye concentrations of 200–1000 mg/l.

Keywords: Anthraquinone Dye, Dye Biodegradation, Biological Reaction Kinetics, Biosorption

Prasad, M.N.V. and Freitas, H. (2000), Removal of toxic metals from solution by leaf, stem and root phytomass of *Quercus ilex* L. (holly oak). *Environmental Pollution*, **110** (2), 277-283.

Full Text: [E\Env Pol110, 277.pdf](E/Env%20Pol110,%20277.pdf)

Abstract: Increased consciousness for safeguarding the aqueous environment has prompted a search for alternative technologies for the removal of toxic metal ions from aqueous solutions. In this regard, a wide variety of biomass is being considered as adsorbents of heavy metals for treatment of industrial and domestic wastewaters as well as natural waters, including drinking water. In the present investigation, the potential of Quercus ilex phytomass from stem, leaf and root as an adsorbent of chromium (Cr), nickel (Ni), copper (Cu), cadmium (Cd) and lead (Pb) at ambient temperature was investigated. The metal uptake capacity of the root for different metals was found to be in the order: Ni > Cd > Pb > Cu > Cr, stem Ni > Pb > Cu > Cd a Cr, and leaf Ni > Cd > Cu > Ph > Cr. The highest amount adsorbed was Ni (root > leaf > stem). Data from this laboratory demonstrated that Ni is sequestered mostly in the roots, where concentrations can be as high as 428.4 ng/g dry wt., when 1-year-old seedlings were treated with Ni (2000 mg/l) in pot culture experiments, compared to 7.63 ng/g dry wt., control (garden and greenhouse soil) topsoil where Ni was present in trace amounts. This proves that the root biomass of Q. ilex has the capacity for complexing Ni. Cr exhibited the least adsorption values for all the three types of phytomass compared to other metals. The trend of adsorption of the phytomass was similar for Ni and Cd, i.e. root > leaf > stem. Desorption with 10 mM Na-4 EDTA was effective (55-90%) and, hence, there exists the possibility of recycling the phytomass. The biosorption results of recycled phytomass suggest that the selected adsorbents are re-usable. The advantages and potential of the Q. ilex phytomass as a biofilter of toxic trace metals, the scope and need for enhancing the efficiency of the Q. ilex phytomass as an adsorbent of metals are presented. (C) 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Quercus Ilex, Chromium, Nickel, Copper, Cadmium, Lead, Stem, Root, Phytomass, Biosorption, Desorption, Aqueous-Solutions, Heavy-Metals, Biosorption, Ions, Recovery, Biomass, Adsorption, Cadmium, Mercury, Nickel

Kaewsarn, P. and Yu, Q. (2001), Cadmium(II) removal from aqueous solutions by pre-treated biomass of marine alga *Padina* sp. *Environmental Pollution*, **112** (2), 209-213.

Full Text: [E\Env Pol112, 209.pdf](E/Env%20Pol112,%20209.pdf)

Abstract: In this study, the adsorption properties of a pre-treated biomass from marine alga Padina sp. a biomass collected from Surin Island, Thailand, for removal of cadmium(II) ions from aqueous solutions was investigated. Batch and column experiments were conducted to determine the adsorption properties of the modified biomass. At a pH of 5. the maximum removal capacity of the biomass is 0.53 mmol/g. The kinetics of cadmium(II) adsorption were fast with 90% of adsorption taking place within 35 min. This study demonstrated that the pre-treated biomass of Padina sp. could be used as an efficient biosorbent for the treatment of cadmium(II)-bearing wastewater streams. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Biosorption, Marine Algae, *Padina* sp., Cadmium(II) Removal, Wastewater Treatment, Heavy-Metal Biosorption, *Rhizopus-arrhizus*, Lead, pH

? Shrimali, M. and Singh, K.P. (2001), New methods of nitrate removal from water. *Environmental Pollution*, **112** (3), 351-359.

Full Text: [2001\Env Pol112, 351.pdf](2001/Env%20Pol112,%20351.pdf)

Abstract: Nitrate contamination in groundwater resources originates mainly from the excessive use of fertilisers and uncontrolled land discharges of treated wastewater. This can cause potential health hazards to infants and pregnant women, thus limiting the direct use of the groundwater resources for the human consumption in several parts of the world, including India. The conventional processes used to eliminate nitrate from water are ion exchange, reverse osmosis and electro-dialysis. The utility of these processes has been limited due to their expensive operation and subsequent disposal problem of the generated nitrate waste brine. This paper presents a comprehensive account of the methods/techniques used for the removal of nitrate ion from water during the last 10 years with special reference to the biological denitrification and fate of the metals in decontamination processes. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Nitrate Removal, Groundwater, Denitrification, Immobilised Enzymes, Metals, Zero-Valent Iron, Drinking-Water, Biological Denitrification, Reduction, Ammonia, Nitrite, Groundwater, Atmosphere, Catalysts

Zulfadhly, Z., Mashitah, M.D. and Bhatia, S. (2001), Heavy metals removal in fixed-bed column by the macro fungus *Pycnoporus sanguineus*. *Environmental Pollution*, **112** (3), 463-470.

Full Text: [E\Env Pol112, 463.pdf](E/Env%20Pol112,%20463.pdf)

Abstract: The ability of *Pycnoporus sanguineus* to adsorb heavy metals from aqueous solution was investigated in fixed-bed column studies. The experiments were conducted to study the effect of important design parameters such as column bed height, flow rate and initial concentration of solution. The breakthrough profiles were obtained in these studies. A mathematical model based on external mass transfer and pore diffusion was used for the prediction of mass transfer coefficient and effective diffusivity of metals in macro-fungi bed. Experimental breakthrough profiles were compared with the simulated breakthrough profiles obtained from the mathematical model. Bed Depth Service Time (BDST) model was used to analyse the experimental data and evaluated the performance of biosorption column. The BDST model parameters needed for the design of biosorption columns were evaluated for lead, copper and cadmium removal in the column. The columns were regenerated by eluting the metal ions using 0.1 M hydrochloric acid solution after the adsorption studies. The columns were subjected to repeated cycles of adsorption of same metal ions and desorption to evaluate the removal efficiency after adsorption-desorption. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorption, Bdst Model, Biosorption, Biosorption, Breakthrough, Cadmium, Column, Copper, Fixed Bed, Fixed Bed Column, Fixed-Bed, Fixed-Bed Column, Heavy Metals, Lead, Macro-Fungus, Mass Transfer, Mass Transfer Coefficient, Metal Ions, Model, Moss, Peat, Pycnoporus Sanguineus, Removal

Lehmann, M., Zouboulis, A.I. and Matis, K.A. (2001), Modelling the sorption of metals from aqueous solutions on goethite fixed-beds. *Environmental Pollution*, **113** (2), 121-128.

Full Text: [E\Env Pol113, 121.pdf](E/Env%20Pol113,%20121.pdf)

Abstract: The research on separation methods of toxic metals from wastewater streams is continuous and intensive and, among them, sorption processes are considered of particular importance, mainly due to their effectiveness. The sorption of chromate anions and zinc cations from dilute aqueous solutions using a packed-bed (column configuration) of synthesised granulated goethite was investigated in the present study. The examined parameters during this investigation were the following: (1) the initial pH value of metal-laden aqueous solution (two representative values at acidic pH, 3.5 and 5.0, were tested), (2) the quantity of sorbent in the column, corresponding to bed height, and (3) the influence of ethylene diamine tetra acetic acid (EDTA) addition, a common, strong chelating agent. The Bed Depth-Service Time model has been applied to the sorption results in order to model the column operation. The removal efficiency of Cr(VI) anions by the sorptive column was found to be higher than that of Zn(II) cations. The presence of EDTA caused a certain decrease of removal efficiency for the case of hexavalent chromium, due to competition for the same sorption sites, while the removal of divalent zinc was increased, due to variation of cation speciation.

Morera, M.T., Echeverría, J.C., Mazkiarán, C. and Garrido, J.J. (2001), Isotherms and sequential extraction procedures for evaluating sorption and distribution of heavy metals in soils. *Environmental Pollution*, **113** (2), 135-144.

Full Text: [E\Env Pol113, 135.pdf](E/Env%20Pol113,%20135.pdf)

Abstract: Heavy metals are potentially toxic to human life and the environment. Their contaminating effect in soils depends on chemical associations. Hence, determining the chemical form of a metal in soils is important to evaluate its mobility and bioavailability. We utilized a sequential extraction procedure and sorption isotherms (monometal and competitive) to evaluate the mobility and distribution of Cd, Cu, Ni, Pb, and Zn in four soils differing in their physicochemical properties: Calcixerollic Xerochrepts (Cx1 and Cx2), Paralithic Xerorthent (Px) and Lithic Haplumbrept (Lh). Most of the metals retained under point B conditions of sorption isotherms were extracted from the more mobile fractions: exchangeable and carbonates, in contrast with the profiles of the original soils where metals were preferently associated with the residual fraction. In soils having carbonate concentration under 6% (Cx1 and Lh), the exchangeable fraction was predominant, whereas in calcareous soils (Cx2 and Px) metals extracted from carbonates predominated. Partitioning profiles were in accordance with the affinity sequences deduced from the initial slope of isotherms and showed that the soils had a greater number of surface sites and higher affinity for Pb and Cu than for Cd, Ni, or Zn. In general, the simultaneous presence of the cations under study increased the percentages of metals released in the exchangeable fraction. The tendency towards less specific forms was more noticeable in Cx2 and Px soils and for Ni, Zn, and Cd. The affinity of inorganic surfaces was larger for Zn than for Cd or Ni, but the affinity of organic surfaces was larger for Cd or Ni than for Zn. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Soil, Heavy Metals, Sorption Isotherm, Tessier Sequential Extraction

Calace, N., Liberatori, A., Petronio, B.M. and Pietroletti, M. (2001), Cadmium(II) Characteristics of different molecular weight fractions of organic matter in landfill leachate and their role in soil sorption of heavy metals. *Environmental Pollution*, **113** (3), 331-339.

Full Text: [E\Env Pol113, 331.pdf](E/Env%20Pol113,%20331.pdf)

Abstract: We have characterised two kinds of municipal landfill leachates derived from ‘old’ and ‘young’ municipal waste landfills on the basis of the molecular weight distribution of the constituents, taking into account that the great variety of leachate constituents prevents any evaluation of the fate and of the role played by each component in the environmental impact. In the sample S1 told leachate), the constituents were distributed over a wider range of molecular weights, high molecular weight fractions were present. In sample S2 (young leachate), the fractions are actually narrower at the lower molecular weights. The high molecular weight fractions of old leachates are found to be complex structures formed by condensed nuclei of carbons substituted by functional groups containing nitrogen, sulphur and oxygen atoms, the low molecular weight fractions of leachates are, instead, characterised by linear chains substituted by oxygenated functional groups such as carboxyl and/or alcoholic groups. After characterising each fraction we studied the role played by these fractions in the soil’s capability for retaining heavy metals [copper (Cu) and cadmium(Cd)]. The Cd uptake increases only on the soil treated with sample S1 characterised by a higher pH value and by the presence of high molecular weight fractions. The Cu uptake also increases on the soil treated with sample S2, characterised by the sole presence of low molecular weight fractions. On the other hand, the metal adsorption tests performed on soil treated with the single fractions show that the amount of Cu and Cd retained by soil treated with the high molecular weight fractions of sample does not increase after 72 h of treatment and that the amount of Cu retained by the low molecular weight fractions of sample S1 and by the fractions of sample S2 increases, but does not justify the amount retained by soil treated with the total leachates. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Landfill Leachate, Molecular Weights Distribution, Spectroscopic Characterisation, Metal Soil Sorption, Solute Adsorption-Isotherm, Humic Substances, General Treatment, Cadmium Sorption, Groundwater, Contaminants, Transport, Goethite, Identification, Classification

Tam, N.F.Y., Wong, J.P.K. and Wong, Y.S. (2001), Repeated use of two *Chlorella* species, *C. vulgaris* and *WW1* for cyclic nickel biosorption. *Environmental Pollution*, **114** (1), 85-92.

Full Text: [E\Env Pol114, 85.pdf](E/Env%20Pol114,%2085.pdf)

Abstract: Two living *Chlorella* species were used to remove nickel from solution containing 30 μg Ni ml−1 in 10 successive cycles. The present study also examined the continued viability of these two algal species after repeated exposure to nickel. The two species of *Chlorella* were *Chlorella vulgaris* (commercially available) and *WW1* (indigenous species isolated from domestic sewage and was tentatively identified as *Chlorella miniata*). The nickel removal percentage of *WW1* cells was maintained at around 85% in the first five cycles, then declined slightly from the fifth cycle onwards, and finally achieved around 70% removal at the end of the 10th cycle. On the contrary, the removal efficiency of *C. vulgaris* declined from 50 to 30% during the 10 cycles of nickel bisorption. At the end of these 10 successive cycles, *WW1* accumulated a substantial amount of Ni2+ (the cumulative cellular Ni concentration was 0.92% dry w.), while the value was only 0.17% in the case of *C. vulgaris.* These results suggest that the local isolate, *WW1*, had more consistent and satisfactory ability for removing Ni than the commercial *C. vulgaris*. Both algal species were still capable of dividing after each nickel treatment cycle, suggesting that the cells were not killed even when significant amounts of nickel were adsorbed/absorbed. However, Ni exposure adversely affected the physiological activity of algal cells as reflected by the decline in division rate and chlorophyll-*a* activity in both species. Such negative effects became more obvious as the number of cyclic treatments was increased. Nevertheless, *WW1* cells appeared to recover from nickel treatment when re-cultivated in commercial medium for 2 weeks. (C) 2001 Elsevier Science Ltd. All rights reserved.

Keywords: Cell Division, Microalgae, Chlorophyll-A, Biosorption, Multiple Cycles, Ni Removal

Calace, N., Nardi, E., Petronio, B.M. and Pietroletti, M. (2002), Adsorption of phenols by papermill sludges. *Environmental Pollution*, **118** (3), 315-319.

Full Text: [E\Env Pol118, 315.pdf](E/Env%20Pol118,%20315.pdf)

Abstract: In this paper we studied the sorption capacity of paper mill sludges for phenols. Phenol, 2-chlorophenol (2-CP). 3-chlorophenol (3-CP), 4-chlorophenol (4-CP), 2-nitrophenol (2-NP), 4-nitrophenol (4-NP), 2.4-dichlorophenol (2,4-dCP), 3,4-dichlorophenol (3,4-DCP) 3,5-dichlorophenol(3,5-DCP) and 2,4, 5-trichlorophenol (2,4,5-TCP) were chosen for the sorption tests. Kinetic experiments showed that substituted-phenol sorption on papermill sludge was rapid (equilibrium was reached after 3 h), conversely, the time taken by the phenol to reach equilibrium conditions was 260 h. Experimental data showed that particle diffusion was involved in the sorption process but was not the only rate-limiting mechanism: several other mechanisms were involved. The adsorption isotherms showed the following order of retention capacity of papermill sludge: 2-NP = 4-NP < < 2-CP <phenol <4-CP < 3-CP <2, 4 DCP<3, 4 DCP-2, 4, 5 TCP<3, 5 DCP. In all cases the experimental data showed a good fit with the Hill equation, which is mathematically equivalent to the Langmuir-Freundlich model obtained by assuming that the surface is homogeneous, and that the adsorption is a cooperative process influenced by adsorbate-adsorbate interactions. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Phenols, Paper Mill Sludge, Adsorption, Waste-Water, Fly-Ash, Isotherms, Bentonite, Removal

Rangsayatorn, N., Upatham, E.S., Kruatrachue, M., Pokethitiyook, P. and Lanza, G.R. (2002), Phytoremediation potential of *Spirulina* (*Arthrospira*) *platensis*: Biosorption and toxicity studies of cadmium. *Environmental Pollution*, **119** (1), 45-53.

Full Text: [E\Env Pol119, 45.pdf](E/Env%20Pol119,%2045.pdf)

Abstract: This study examines the possibility of using *Spirulina* (*Arthrospira*) platensis TISTR 8217 to remove low concentrations of cadmium (less than 100 mg 1) from wastewater. The cyanobacteria were exposed to six different cadmium concentrations for 96 h, and the growth rate was determined using an optical density at 560 nm. The inhibiting concentration (IC50) was estimated using probit analysis. The IC50 at 24, 48, 72, and 96 h were 13.15, 16.68, 17.28, and 18.35 mg 1 Cd, respectively. Cellular damage was studied under a light microscope and a transmission electron microscope. Swollen cells and fragmented filaments were observed. Cell injury increased with increasing concentrations of cadmium. Ultrastructural changes were observed in the algae exposed to cadmium concentrations both close to IC50 (14.68 mg 1) and at IC50 (18.35 mg 1). The alterations induced by cadmium were disintegration and disorganization of the thylakoid membranes, presence of large intrathylakoidal space, increase of polyphosphate bodies, and cell lysis. In addition, the cadmium adsorption by algal cells was studied. Environmental factors were found to have an effect on biosorption. The uptake of cadmium was not affected by the temperature of the solution, but the sorption was pH dependent. The optimum pH for biosorption of algal cells was 7. The cadmium uptake process was rapid, with 78% of metal sorption completed within 5 min. The sorption data fit well to the Langmuir isotherm. The maximum adsorption capacity for S. platensis was 98.04 mg Cd per g biomass. (C) 2002 Published by Elsevier Science Ltd.

Keywords: Cyanobacteria, Cadmium, IC50, Biosorption, Ultrastructure, Phytoremediation, Alga *Chlorella-Vulgaris*, Heavy-Metal Elements, Biological-Systems, Zinc, Accumulation, Cyanophyceae, Microalgae, Copper, Ions

? Lin, Y.F., Jing, S.R., Wang, T.W. and Lee, D.Y. (2002), Effects of macrophytes and external carbon sources on nitrate removal from groundwater in constructed wetlands. *Environmental Pollution*, **119** (3), 413-420.

Full Text: [2002\Env Pol119, 413.pdf](2002/Env%20Pol119,%20413.pdf)

Abstract: Several microcosm wetlands implanted and planted with five macrophytes (Phragmites australis, Commelina communis, Penniserum purpureum, Ipomoea aquatica, and *Pistia stratiotes*) were employed to remove nitrate from groundwater at a concentration of 21-47 mg NO3-N/l. In the absence of external carbon, nitrate removal rates ranged from 0.63 to 1.26 g NO3-N/m2/day for planted wetlands. Planted wetlands exhibited significantly greater nitrate removal than unplanted wetlands (P<0.01), indicating that macrophytes are essential to efficient nitrate removal. Additionally, a wetland planted with Penniserum showed consistently higher nitrate removal than those planted with the other four macrophytes, suggesting that macrophytes present species-specific nitrate removal efficiency possibly depending on their ability to produce carbon for denitrification. Although adding external carbon to the influent improved nitrate removal, a significant fraction of the added carbon was lost via microbial oxidation in the wetlands. Planting a wetland with macrophytes with high productivity may be an economic way for removing nitrate from groundwater. According to the harvest result, 4-11% of nitrogen removed by the planted wetland was due to vegetation uptake, and 89-96% was due to denitrification. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Biological Denitrification, Constructed Wetlands, Denitrification, Groundwater, Macrophytes, Nitrate, Nitrogen Removal, *Pistia Stratiotes*

Niu, J.F., Chen, J.W., Martens, D., Quan, X., Yang, F.L., Kettrup, A. and Schramm, K.W. (2003), Photolysis of polycyclic aromatic hydrocarbons adsorbed on spruce [*Picea abies* (L.) Karst.] needles under sunlight irradiation. *Environmental Pollution*, **123** (1), 39-45.

Full Text: [E\Env Pol123, 39.pdf](E/Env%20Pol123,%2039.pdf)

Abstract: Photolysis of polycyclic aromatic hydrocarbons (PAHs) sorbed on surfaces of spruce [*Picea abies* (L.) Karst.] needles under sunlight irradiation was investigated. PAHs were produced by combustion of polyvinyl chloride (PVC), wood, high-density polyethylene (HDPE), and styrene in a stove. The factors of sunlight irradiation on the surfaces of spruce needles were taken into consideration when investigating the kinetic parameters. The photolysis of the 18 PAHs under study follows first-order kinetics. The photolysis half-lives range from 15 h for dibenzo(a,h)anthracene to 75 h for phenanthrene. Photolysis of some PAHs on surfaces of spruce needles may play an important role on the fate of PAHs in the environment. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: B Radiation, Coal Fly-Ash, Conifer Needles, Daphnia- Magna, Extraction, Kinetics, Pahs, Photoinduced Toxicity, Photolysis, Spruce Needles, Sunlight Irradiation, UV-B, Water

? Langdon, C.J., Piearce, T.G., Meharg, A.A. and Semple, K.T. (2003), Interactions between earthworms and arsenic in the soil environment: A review. *Environmental Pollution*, **124** (3), 361-373.

Full Text: [2003\Env Pol124, 361.pdf](2003/Env%20Pol124,%20361.pdf)

Abstract: Chemical pollution of the environment has become a major source of concern. In particular, many studies have investigated the impact of pollution on biota in the environment. Studies on metalliferous contaminated mine spoil wastes have shown that some soil organisms have the capability to become resistant to metal/metalloid toxicity. Earthworms are known to inhabit arsenic-rich metalliferous soils and, due to their intimate contact with the soil, in both the solid and aqueous phases, are likely to accumulate contaminants present in mine spoil. Earthworms that inhabit metalliferous contaminated soils must have developed mechanisms of resistance to the toxins found in these soils. The mechanisms of resistance are not fully understood; they may involve physiological adaptation (acclimation) or be genetic. This review discusses the relationships between earthworms and arsenic-rich mine spoil wastes, looking critically at resistance and possible mechanisms of resistance, in relation to soil edaphic factors and possible trophic transfer routes. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Eisenia-Foetida Oligochaeta, Heavy-Metals, Lumbricus-Rubellus, Dendrodrilus-Rubidus, Small Mammals, Toxicity, Resistance, Bioavailability, Metallothionein, Contamination

Notes: highly cited

Waranusantigul, P., Pokethitiyook, P., Kruatrachue, M. and Upatham, E.S. (2003), Kinetics of basic dye (Methylene blue) biosorption by giant duckweed (*Spirodela polyrrhiza*). *Environmental Pollution*, **125** (3), 385-392.

Full Text: [E\Env Pol125, 385.pdf](E/Env%20Pol125,%20385.pdf)

Abstract: Wastewater containing pigments and/or dyes can cause serious water pollution problems in the form of reduced light penetration and photosynthesis, and the toxicity from heavy metals associated with pigments and/or dyes. Laboratory investigations, of the potential use of dried Spirodela polyrrhiza biomass as an adsorbent for the removal of the basic dye Methylene blue from aqueous solution were conducted. A series of experiments were undertaken in an agitated batch adsorber to assess the effect of the system variables, i.e. sorbent dosage, pH, and contact time. The results showed that as the amount of the dried S. polyrrhiza increased, the percentage of dye sorption increased accordingly. At pH 2.0 the sorption of dye was not favorable, while the sorption at other pHs (3.0-11.0) was remarkable. There was no significant difference in the dye concentration remaining when the pH was increased from 3.0 to 11.0. The dye removal time was influenced by the initial dye concentration, and the process followed the first-order rate kinetics. The rate constants for intraparticle diffusion were 1.00 and 3.27 mg/g/min1/2 for 300 and 500 mg/l of dye, respectively. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Adsorbents, Adsorption, Aqueous-Solutions, Basic Dye, Batch, Biosorption, Color Removal, Cost, Dye, Dyes, Heavy Metals, Kinetics, Metals, Methylene Blue, Palm-Fruit Bunch, Red, Sorption, Spirodela Polyrrhiza, Textile Effluents, Waste-Water, Water

Benaissa, H. and Benguella, B. (2004), Effect of anions and cations on cadmium sorption kinetics from aqueous solutions by chitin: Experimental studies and modeling. *Environmental Pollution*, **130** (2), 157-163.

Full Text: [E\Env Pol130, 157.pdf](E/Env%20Pol130,%20157.pdf)

Abstract: The effect of ions, including Na+, Mg2+, Ca2+, Cl-, SO42- and CO32-, at various initial concentrations, on the kinetics of cadmium sorption by chitin was studied at 25 °C and free initial pH solution in batch conditions. The presence of these ions in solution was found to inhibit the uptake of cadmium by chitin to different degrees: sodium and chloride ions have no significant effect. For Mg2+, Ca2+, SO42- and CO32- ions, the effects ranged from a large inhibition of cadmium by Ca2+ and CO32- to a weak inhibition by Mg2+ and SO42-. These results indicate that the uptake sites of these ions are the same. No ion was found to enhance cadmium uptake. The results also showed that the kinetics of sorption are best described by a pseudo second-order expression than a first or second-order model.

Keywords: Author Keywords, Sorption, Cadmium, Chitin, Kinetics, Ions Effect

Laureysens, I., Blust, R., De Temmerman, L., Lemmens, C. and Ceulemans, R. (2004), Clonal variation in heavy metal accumulation and biomass production in a poplar coppice culture: I. Seasonal variation in leaf, wood and bark concentrations. *Environmental Pollution*, **131** (3), 485-494.

Full Text: [E\Env Pol131, 485.pdf](E/Env%20Pol131,%20485.pdf)

Abstract: The use of plants to decontaminate soils polluted by heavy metals has received considerable attention in recent years as a low-cost technique. Poplars (Populus spp.) can accumulate relatively high levels of certain metals, and have the added advantage of producing biomass that can be used for energy production. A short rotation coppice culture with 13 poplar clones was established on a former waste disposal site, which was moderately polluted with heavy metals. Total content of metals in leaves, wood and bark were determined in August and October, November. Significant clonal differences in accumulation were found for most metals, although clones with the highest concentration of all metals were not found. Cadmium, zinc and aluminium were most efficiently taken up. The lowest concentration was found in wood, the highest concentrations were generally found in senescing leaves, making removal and treatment of fallen leaves necessary. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Fagus-Sylvatica L, Heavy Metals, Phytoremediation, Phytoremediation, Plants, Pollution, Poplar (Populus spp.), Prospects, Short Rotation Coppice, Soil, Stands, Tolerance, Trees, Waste Disposal Site, Yields

Jang, A., Seo, Y. and Bishop, P.L. (2005), The removal of heavy metals in urban runoff by sorption on mulch. *Environmental Pollution*, **133** (1), 117-127.

Full Text: [E\Env Pol133, 117.pdf](E/Env%20Pol133,%20117.pdf)

Abstract: A series of adsorption experiments was conducted in order to assess the ability of three mulches to remove several of the heavy metal ions typically encountered in urban runoff. Three types of mulch, cypress bark (C), hardwood bark (H), and pine bark nugget (P), were selected as potential sorbents to capture heavy metals in urban runoff. The hardwood bark (H) mulch had the best physicochemical properties for adsorption of heavy metal ions. In addition, because of its fast removal rate and acceptably high capacity for all the heavy metal ions, it was concluded that the H mulch is the best of the three adsorbents for treatment of urban runoff containing trace amounts of heavy metals. In order to investigate the sorption isotherm, two equilibrium models, the Freundlich and Langmuir isotherms, were analyzed. The sorption of these metals on H mulch conformed to the linear form of the Langmuir adsorption equation. At pH 5 and 6, the Langmuir constants (*S*m) for each metal were found to be 0.324 and 0.359 mmol/g (Cu), 0.306 and 0.350 mmol/g (Pb), and 0.185 and 0.187 mmol/g (Zn) at 25 °C.

Keywords: Adsorption, Batch Test, Capacity, Cu(II), Heavy Metals, Ions, Mulch, Sludge, Soils, Stormwater Runoff, Urban Runoff, Water

? Fine, P., Scagnossi, A., Chen, Y. and Mingelgrin, U. (2005), Practical and mechanistic aspects of the removal of cadmium from aqueous systems using peat. *Environmental Pollution*, **138** (2), 358-367.

Full Text: [2005\Env Pol138, 358.pdf](2005/Env%20Pol138,%20358.pdf)

Abstract: A sphagnum peat moss removed Cd from aqueous solutions very efficiently, and its effectiveness in taking up the metal was significantly enhanced by exposure to a 1 N NaOH solution. The capacity of the untreated peat for Cd reached 300 g/kg and that of the NaOH-activated peat was over 400 g/kg. Although saturation was rarely reached, the Cd uptake from concentrated solutions often exceeded 200 g/kg. In column experiments, 1 g of the NaOH-activated peat completely removed the metal from over 0.2 L of a 200-mg/L Cd solution (final Cd concentration < 0.1 mg/L), while 1 g of non-activated peat cleared Cd from less than 25% of that volume. The cation exchange capacity measured for the peat depended on the time of contact with the exchanging solution. After 72 h contact, the value for the NaOH-activated peat was 135 cmolc/kg. In addition to uptake by exchange, a significant amount of Cd was sorbed by non-exchange mechanisms. FTIR spectroscopy revealed the importance of carboxyl groups in the uptake. Peat can efficiently remove transition metals from aqueous media.

Keywords: CEC, Cleanup, FTIR, Transition Metals, Cation-Exchange Capacity, Waste-Water, Organic-Matter, Metal-Ions, Moss, Acid, Zinc, Adsorption, Adsorbent, Sphagnum

? Chen, S.B., Zhu, Y.G., Ma, Y.B. and McKay, G. (2006), Effect of bone char application on Pb bioavailability in a Pb-contaminated soil. *Environmental Pollution*, **139** (3), 433-439.

Full Text: [2006\Env Pol139, 433.pdf](2006/Env%20Pol139,%20433.pdf)

Abstract: The effects of bone char (BC) application oil the bioavailability of Pb in a polluted soil from Hunan Province, China were examined. The Pb-contaminated soil was treated with two types of bone char, one from the UK and the other from China. The bioavailability of Pb was determined in terms of the uptake by Chinese cabbage (Brassica chinensis L.), sequential extraction and X-ray diffraction analysis. The results indicate that the Pb concentrations in both shoots and roots decreased with increasing quantities of added bone char, and the application of BC from the UK at the rate of 1.6% (w:w) had the largest effect. Lead Pb concentrations in the shoots and roots decreased by 56.0% and 75.9% respectively, whereas the application of BC from Zhejiang Province, China at the rate of 1.6% (w:w) reduced Pb concentrations in the shoots and roots to 2.04 mg kg-1 and 8.42 mg kg-1, respectively, only 45.8% and 30.2% compared to file control treatment. Sequential extraction results indicate that the addition of bone char, as a metal-immobilizing agent, substantially transforms soil Pb from non-residual fractions to the residual fraction. The transformation was further confirmed using X-ray diffraction studies. (c) 2005 Elsevier Ltd. All rights reserved.

Keywords: Bone Char Amendment, Bioavailability, Pb-Contaminated Soil, Lead, Immobilization, Amendments, Phosphorus, Extraction, Additions, Sorption, Cadmium, Apatite, Metals

? Pei, Z.G., Shan, X.Q., Wen, B., Zhang, S.Z., Yan, L.G. and Khan, S.U. (2006), Effect of copper on the adsorption of p-nitrophenol onto soils. *Environmental Pollution*, **139** (3), 541-549.

Full Text: [2006\Env Pol139, 541.pdf](2006/Env%20Pol139,%20541.pdf)

Abstract: The effect of copper on adsorption of p-nitrophenol on two typical Chinese soils was investigated using a batch-equilibration method. Adsorption experiments were carried out when both copper and p-nitrophenol were adsorbed simultaneously, and when copper was previously adsorbed on soils. It was observed that adsorption of p-nitrophenol decreased with increasing copper concentrations thereby indicating a competition between copper and p-nitrophenol for occupying the adsorption sites on soils. Moisture increased the hydrated sphere and the acidity of water surrounding the cation, which further reduced the adsorption of p-nitrophenol. Fourier transform infrared spectroscopy study provided the direct evidence for the coordination of p-nitrophenol sorbed by soils with metal cation in n-hexane system. It was observed that the perturbations included a red shift of the νasym (NO) band, a concomitant blue-shift of the νsym (NO) band and a blue-shift of C–N band when compared with the infrared spectra obtained from water solution. The adsorption of p-nitrophenol onto soils decreased in the presence of copper due to its competition for the adsorption sites.

Keywords: Adsorption, Soil, p-Nitrophenol, Copper

? Lodeiro, P., Barriada, J.L., Herrero, R. and Sastre de Vicente, M.E. (2006), The marine macroalga *Cystoseira* baccata as biosorbent for cadmium(II) and lead(II) removal: Kinetic and equilibrium studies. *Environmental Pollution*, **142** (2), 264-273.

Full Text: [2006\Env Pol142, 264.pdf](2006/Env%20Pol142,%20264.pdf)

Abstract: This work reports kinetic and equilibrium studies of cadmium(II) and lead(II) adsorption by the brown seaweed *Cystoseira* baccata. Kinetic experiments demonstrated rapid metal uptake. Kinetic data were satisfactorily described by a pseudo-second order chemical sorption process. Temperature change from 15 to 45 °C showed small variation on kinetic parameters. Langmuir–Freundlich equation was selected to describe the metal isotherms and the proton binding in acid–base titrations. The maximum metal uptake values were around 0.9 mmol g−1 (101 and 186 mg g−1 for cadmium(II) and lead(II), respectively) at pH 4.5 (raw biomass), while the number of weak acid groups were 2.2 mmol g−1 and their proton binding constant, KH, 103.67 (protonated biomass). FTIR analysis confirmed the participation of carboxyl groups in metal uptake. The metal sorption was found to increase with the solution pH reaching a plateau above pH 4. Calcium and sodium nitrate salts in solution were found to affect considerably the metal biosorption.

Keywords: Biosorption, Marine Macroalgae, Cadmium(II), Lead(II), Potentiometric Titration

? Qin, F., Wen, B., Shan, X.Q., Xie, Y.N., Liu, T., Zhang, S.Z. and Khan, S.U. (2006), Mechanisms of competitive adsorption of Pb, Cu, and Cd on peat. *Environmental Pollution*, **144** (2), 669-680.

Full Text: [2006\Env Pol144, 669.pdf](2006/Env%20Pol144,%20669.pdf)

Abstract: Combined use of batch equilibration adsorption and X-ray absorption spectroscopy (XAS) was employed to study the mechanisms of competitive adsorption of Ph, Cu, and Cd on Danish and Heilongjiang peat in single- and multi-solute systems. The adsorption capacity and initial adsorption rate on the same peat in single-solute systems followed the order Ph > Cu > Cd. Both the adsorbed amount of each metal (q’(m)) and its initial adsorption rate were decreased in multi-solute systems. It was observed that the adsorbed amounts of metals at low-energy adsorption sites (q(m,l)) decreased pronouncedly compared to those at high-energy adsorption sites (q(m,2)), indicating that the competitive adsorption of Ph, Cu and Cd occurred mainly at the low-energy adsorption sites. XAS study revealed that both Ph and Cu were coordinated in peat predominantly to carboxylic moieties without excluding the hydroxyl groups, thereby providing an insight into the mechanism of competitive adsorption of Pb and Cu on peat. (c) 2006 Elsevier Ltd. All rights reserved.

Keywords: Peat, Heavy Metals, Competitive Adsorption, Kinetics, X-Ray Absorption Spectroscopy, Aqueous-Solution, Activated Carbon, Pb(II) Sorption, Organic-Matter, Metal-Ions, Surface Complexation, Water Interface, Binding-Sites, Waste-Water, Bone Char

? Jing, C.Y., Meng, X.G., Calvache, E. and Jiang, G.B. (2009), Remediation of organic and inorganic arsenic contaminated groundwater using a nanocrystalline TiO2-based adsorbent. *Environmental Pollution*, **157** (8-9), 2514-2519.

Full Text: [2009\Env Pol157, 2514.pdf](2009/Env%20Pol157,%202514.pdf)

Abstract: A nanocrystalline TiO2-based adsorbent was evaluated for the simultaneous removal of As(V), As(III), monomethylarsonic acid (MMA), and dimethylarsinic acid (DMA) in contaminated groundwater. Batch experimental results show that As adsorption followed pseudo-second order rate kinetics. The competitive adsorption was described with the charge distribution multi-site surface complexation model (CD-MUSIC). The groundwater containing an average of 329 μg L-1 As(III), 246 μg L-1 As(V), 151 μg L-1 MMA, and 202 mu g L-1 DMA was continuously passed through a TiO2 filter at an empty bed contact time of 6 min for 4 months. Approximately 11000, 14 000, and 9900 bed volumes of water had been treated before the As(III), As(V), and MMA concentration in the effluent increased to 10 μg L-1. However, very little DMA was removed. The EXAFS results demonstrate the existence of a bidentate binuclear As(V) surface complex on spent adsorbent, indicating the oxidation of adsorbed As(III). (c) 2009 Elsevier Ltd. All rights reserved.

Keywords: Adsorbent, Adsorption, Adsorptive Filtration, Arsenic, As(III), As(V), Behavior, Cd-Music, Charge, Charge Distribution Multi-Site Surface Complexation Model, Competitive, Competitive Adsorption, Complexation, Concentration, Contaminated Groundwater, Dimethylarsinic Acid, Distribution, DMA, Exafs, Experimental, Groundwater, Inorganic Arsenic, Ion Adsorption, Kinetics, L1, Model, Organic, Organic Arsenic, Oxidation, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second-Order, Rate Kinetics, Remediation, Removal, Rights, Spectroscopy, Surface, Surface Complexation, Surface Complexation Model, TiO2, Titanium-Dioxide, Water, Water-Treatment Adsorbents

? Zhang, Z.Z., Li, M.Y., Chen, W., Zhu, S.Z., Liu, N.N. and Zhu, L.Y. (2010), Immobilization of lead and cadmium from aqueous solution and contaminated sediment using nano-hydroxyapatite. *Environmental Pollution*, **158** (2), 514-519.

Full Text: [2010\Env Pol158, 514.pdf](2010/Env%20Pol158,%20514.pdf)

Abstract: The effectiveness and mechanism of nano-hydroxyapatite particles (nHAp) in immobilizing Pb and CA from aqueous solutions and contaminated sediment were investigated. The maximum sorption amount (Q(max)) of Pb and Cd in aqueous solution was 1.17 and 0.57 mmol/g. The X-ray diffraction (XRD) and X-ray photoelectron spectroscopy (XPS) surface and depth analysis indicated that dissolution-precipitation is the primary immobilization mechanism for Pb, while surface complexation and intraparticle diffusion account for Cd sequestration. Different amounts of nHAp (0-10% nHAp/dry weight) were added to the contaminated sediment. Sequential extraction showed that nHAp could effectively reduce the exchangeable fraction of Pb and Cd in the sediment and significantly reduce the concentration in porewater. The results in this study showed that nHAp can immobilize Pb and Cd in sediment effectively. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Additions, Analysis, Apatite, Aqueous Solution, Aqueous Solutions, Cadmium, Cd, Complexation, Concentration, Copper, Diffusion, Effectiveness, Extraction, Heavy-Metals, Immobilization, Intraparticle Diffusion, Lead, Mechanism, Nano-Hydroxyapatite, Particles, Pb, Phosphate Amendments, Primary, Removal, Rights, Sediment, Sequestration, Soils, Solution, Solutions, Sorption, Sorption Kinetics, Speciation, Spectroscopy, Surface, Surface Complexation, X-Ray, X-Ray Diffraction, X-Ray Photoelectron Spectroscopy, XPS, XRD

? Gao, P., Feng, Y.J., Zhang, Z.H., Liu, J.F. and Ren, N.Q. (2011), Comparison of competitive and synergetic adsorption of three phenolic compounds on river sediment. *Environmental Pollution*, **159** (10), 2876-2881.

Full Text: [2011\Env Pol159, 2876.pdf](2011/Env%20Pol159,%202876.pdf)

Abstract: Knowledge of toxic chemical sorption by soil/sediment is critical for environmental risk assessment of toxic chemicals, especially for the multi-sorbate system in river ecosystem. Sorption characteristics of 2,4-Dichlorophenol, 2,4-Dinitrophenol and 2,4-Dimethyphenol on sediment were investigated. Adsorption isotherms in single- and multi-sorbate systems fitted well the Freundlich model. The adsorption effects were different among three selected phenolic compounds in single- and multi-sorbate systems. The synergetic affect that 2,4-Dinitrophenol and 2,4-Dimethyphenol bring to 2,4-Dichlorophenol can be explained by the compression of double electronic layer and the charge neutrality. Adsorption kinetic results showed that pseudo-second-order model can be used to describe the experimental data and the adsorption affinity of phenolic compounds influenced greatly by the adsorption velocity. The present study suggests that the fate and transport of emerging pollutants such as phenolic compounds could be affected in the presence of different hydrophobic pollutants in aquatic systems. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Activated Carbon, Adsorption, Adsorption Isotherms, Aqueous-Solution, Competitive Effect, Desorption, Kinetics, Mechanisms, Metal-Ions, Organic Contaminants, Phenolic Compounds, Sediment, Soils, Sorption, Sorption, Surface-Water, Synergetic Effect

# Title: Environmental Pollution Series A-Ecological and Biological

(Environ. Pollut., Ser. A, Ecol. Biol.)

Full Journal Title: [Environmental Pollution Series A-Ecological and Biological](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=13011&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=dec065aad54f1fe990619f618a323489)

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Language:

Publisher: Elsevier Sci Ltd, Oxford

Publisher Address:

Subject Categories:

: Impact Factor

Chigbo, F.E., Smith, R.W. and Shore, F.L. (1982), Uptake of arsenic, cadmium, lead and mercury from polluted waters by the water hyacinth *Eichhoria crassipes*. *Environmental Pollution Series A-Ecological and Biological*, **27** (1), 31-36.

Full Text: [E\Env Pol Ser A27, 31.pdf](E/Env%20Pol%20Ser%20A27,%2031.pdf)

Abstract: The water hyacinth *Eichornia crassipes* was studied as a pollution monitor for the simultaneous accumulation of arsenic, cadmium, lead and mercury. After cultivation of the plants for 2 days in tanks containing 10 ppm of each of the metals in aqueous solution, the plants were harvested and rinsed with tap water. The leaves and stems were separated and analysed for each of the metals. The ratio of the concentrations of arsenic and mercury in the leaves to the concentrations in the stems was found to be 2: 1. Cadmium and lead showed a concentration ratio in leaves to stems of about 1: 1. The leaf concentration of arsenic was the lowest of the metals at 0.3428 mg g−1 of dried plant material whilst the leaf concentration of cadmium was highest at 0.5740 mg g−1 of dried plant material.

Control plants were grown in unpolluted water. Plants grown in Bay St. Louis, Mississippi sewage lagoon were also analysed. The mercury concentrations of the leaves of plants grown in the sewage lagoon were significantly different from the control sample which had a concentration of 0.0700 mg g−1 of dried plant material.

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Full Text: [1982\Env Pol Ser A28, 149.pdf](1982/Env%20Pol%20Ser%20A28,%20149.pdf)

Abstract: Nitrilotriacetic acid (NTA) has been suggested as a detergent builder in place of the polyphosphates. Experiments have been carried out using laboratory-scale activated sludge simulations receiving synthetic sewage and heavy metals to determine the effects of transient changes in temperature on the biodegradation of NTA. The results demonstrated that there were no adverse effects on the biodegradation of NTA and no effect on effluent metal concentrations when the temperature was decreased from 17.5°C to approximately 12.5°C. However, a drop in temperature from 17.5°C to approximately 9.5°C resulted in incomplete biodegradation of NTA and an associated increase in effluent concentrations of cadmium, copper, lead and zinc. These effects were reversed as the temperature was allowed to return to 17.5°C.

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Full Text: [1982\Env Pol Ser A32, 1.pdf](1982/Env%20Pol%20Ser%20A32,%201.pdf)

Abstract: A series of experiments were undertaken using an activated sludge pilot plant treating settled sewage to determine the effects of transient temperature changes on the biodegradation of nitrilotriacetic acid (NTA). The temperature reductions were carried out at two different concentrations of influent heavy metals. Temperature reductions from 17.5°C to 10°C caused a slight decrease in NTA removal. The decrease in NTA removal was more significant during temperature changes from 17.5°C to 7.5°C. Temperature reductions from 17.5°C to 6°C resulted in a substantial decrease in NTA removal. Concentrations of NTA in the effluent attained higher values in experiments with high influent metals concentrations than in comparable experiments with low influent metals concentrations.

Krishnayya, N.S.R. and Bedi, S.J. (1986), Effect of automobile lead pollution on *Cassia tora* L. and *Cassia occidentalis* L. *Environmental Pollution Series A-Ecological and Biological*, **40** (3), 221-226.

Full Text: [E\Env Pol Ser A40, 221.pdf](E/Env%20Pol%20Ser%20A40,%20221.pdf)

Abstract: The effect of car exhaust lead pollution on pollen germination and seed viability of two roadside weeds, *Cassia tora* L. and *Cassia occidentalis* L., was studied. A decrease in the percentage of pollen germination and seed viability was observed in plants growing near Highway No. 8. With increasing distance from the highway pollen germination and seed viability improved, and at a distance of 60 m from the road the percentage of pollen germination and seed viability became closer to normal. The decrease in pollen germination and reduction in viability were directly proportional to the amount of lead accumulated in the plants.

# Title: Environmental Pollution Series B-Chemical and Physical

(Environ. Pollut., Ser. B, Chem. Phys.)

Full Journal Title: [Environmental Pollution Series B-Chemical and Physical](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=13012&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=3666e5d1a4fe84497bbf237e8a6da5a8)

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Clausen, I.H.S. (1984), Lead(Pb) in spiders-a possible measure of atmospheric Pb pollution. *Environmental Pollution Series B-Chemical and Physical*, **8** (3), 217-230.

Full Text: [E\Env Pol Ser B8, 217.pdf](E/Env%20Pol%20Ser%20B8,%20217.pdf)

Abstract: Lead concentrations were measured in eight species of spider and in the lichen *Lecanora conizaeoides* Nyl. ex Cromb. Significant differences between spider species were found. The correlation between lead in *Araneus umbraticus* Clerck (*Y*) and lead in *L. conizaeoides* (*X*) was highly significant, it being possible to describe the relationship by means of the formula: *Y* = 0.804*X*0.582. It is concluded that lead in *A. umbraticus* may be used as a measure of atmospheric lead pollution.

Purchase, N.G. and Fergusson, J.E. (1986), *Chione* (*Austrovenus*) *stutchburyi*, a New Zealand cockle, as a bio-indication for lead pollution. *Environmental Pollution Series B-Chemical and Physical*, **11** (2), 137-151.

Full Text: [E\Env Pol Ser B11, 137.pdf](E/Env%20Pol%20Ser%20B11,%20137.pdf)

Abstract: The shellfish *Chione (Austrovenus) stutchburyi* has been studied as a bio-indicator for lead in an estuarine environment near Christchurch, New Zealand. Over four years the mean lead level in the soft tissue was 1·16 small mu, Greekg g−1. The levels responded to significant rainfall events in the catchment area. Over the four years a fall in lead levels corresponded to reduced lead inputs into a river feeding the estuary. In addition to climatic and lead source changes, seasonal effects and shell size also need to be considered, as lead levels fall in the early summer and are elevated in small shellfish. The use of the shell as a bio-indicator for lead necessitates sectional and surface shell analysis rather than whole shell analysis. Both shell age and depth into the shell are variables that associate with lead.

Hopkin, S.P., Hardisty, G.N. and Martin, M.H. (1986), The woodlouse *Porcellio scaber* as a ‘biological indicator’ of zinc, cadmium, lead and copper pollution. *Environmental Pollution Series B-Chemical and Physical*, **11** (4), 271-290.

Full Text: [E\Env Pol Ser B11, 271.pdf](E/Env%20Pol%20Ser%20B11,%20271.pdf)

Abstract: The amounts of zinc, cadmium, lead and copper were determined in the hepatopancreas and whole body of the woodlouse *Porcellio scaber* (Crustacea, Isopoda) and soil and leaf litter collected from 89 sites in the counties of Avon and Somerset, south-west England. Maps were drawn to compare the regional distribution of concentrations of metals in the samples.

The main source of zinc, cadmium, lead and copper pollution was centred on Avonmouth to the north-west of Bristol, the site of a primary zinc, lead and cadmium smelting works. Concentrations of all four metals in the hepatopancreas, whole woodlice, soil and leaf litter were above background levels over a large area on all maps which, in the case of cadmium in the hepatopancreas, extended for 25 km to the east of the smelting works.

The correlation coefficients between the concentrations of each metal in woodlice and soil, and between woodlice and leaf litter, were positive and statistically significant (*P* < 0·001) in all cases. At individual sites, however, particularly those associated with disused mining areas, rubbish tips or busy roads, the concentrations of zinc, cadmium, lead and copper in woodlice could not have been predicted accurately from the levels of metals in leaf litter or soil due to the large scatter of data points along the lines of ‘best fit’.

Future exercises in pollution monitoring should include analysis of at least one representative of the primary consumers of vegetation to enable the ‘availability’ of metals to the fauna to be reliably assessed. *Porcellio scaber* is probably the ideal ‘indicator species’ in the UK because it has a strong affinity for zinc, cadmium, lead and copper, is large enough to provide sufficient tissue for analysis, and is common in a wide range of rural and urban habitats.

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Full Text: [1986\Env Pol Ser B11, 303.pdf](1986/Env%20Pol%20Ser%20B11,%20303.pdf)

Abstract: Distribution coefficients (*K*d) indicate the capability of a soil to retain a solute and also the extent of its movement in a solution phase. The purpose of the study was to determine *K*d values for the heavy metals Ni and Zn in soils, in order to evaluate the ability of different soils to retain the metals. Batch equilibrium experiments on Ni and Zn were conducted to obtain adsorption isotherms, *K*d values and distribution curves for Ni and Zn, with six concentrations of test solutions and three soils. Ni and Zn adsorption increased significantly as the concentration of the cation increased in the test solution. The range of *K*d values for Zn and Ni was 140–684 and 152–388 ml g−1, respectively, for the soils investigated. The Mecklenburg clay, with high cation-exchange capacity (CEC), gave high *K*d values for both Ni and Zn. There was no consistent relationship between the *K*d values and soil pH and organic matter. The distribution curves for Ni and Zn showed negative correlation between solution concentration of Ni and Zn and *K*d values. The results of this study indicate better retardation of Zn as compared to Ni by the soils.

# Title: Environmental & Process Monitoring

Meyer, R.L. and Vernon, D., Field experiences using dilution probe techniques for continuous source emission monitoring. *Environmental & Process Monitoring*, 1-11.

# Title: Environmental Products Manufacturing

Crocker, M. and Broertjes, P. (1997), On-line NOX/NH3 measurement in DeNOX units. *Environmental Products Manufacturing*, **January-February** (225), 47-52.

# Title: Environmental Progress

Full Journal Title: [Environmental Progress](http://www3.interscience.wiley.com/cgi-bin/jhome/107615861)

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Engineering, Chemical: Impact Factor 0.775, 29/110

Environmental Sciences: Impact Factor 0.775, 65/126 (1999), Impact Factor 0.588, 79/127 (2000)

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Ku, Y. and Peters, R.W. (1986), The effect of weak chelating agents on the removal of heavy metals by precipitation processes. *Environmental Progress*, **5** (3), 147-153.

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Full Text: [1989\Env Pro8, 62.pdf](1989/Env%20Pro8,%2062.pdf)

Ying, W., Dietz, E.A. and Woehr, G.C. (1990), Adsorptive capacities of activated carbon for organic constituents of wastewaters. *Environmental Progress*, **9** (1), 1-9.

Full Text: [1990\Env Pro9, 1.pdf](1990/Env%20Pro9,%201.pdf)

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Full Text: [1990\Env Pro9, 35.pdf](1990/Env%20Pro9,%2035.pdf)

Abstract: Chitosan, a polyglucosamine, can be formed by de-acetylating chitin, a major structural component of crustacean shells. Crab shell particles were treated and deacetylated to elaborate chitosan on their outer peripheries. Experimental data and an approximate preliminary economic analysis are presented to show the potential of using treated crab shell waste for purifying electroplating rinsewater. This approach is compared with currently used precipitation technology for removing metal ions.

Jang, L.K., Brand, W., Resong, M., Mainieri, W. and Geesey, G.G. (1989), Feasibility of using alginate to absorb dissolved copper from aqueous media. *Environmental Progress*, **9**, 269-274.

Full Text: [1989\Env Pro9, 269.pdf](1989/Env%20Pro9,%20269.pdf)

Huang, Y.L., Sundar, G. and Fan, L.T. (1991), MIN-CYANIDE: An expert system for cyanide waste minimization in electroplating plants. *Environmental Progress*, **10** (2), 89-95.

Full Text: [1991\Env Pro10, 89.pdf](1991/Env%20Pro10,%2089.pdf)

Abstract: Rapid development of technologies and production systems is often accompanied by the increased generation of hazardous or toxic wastes. Among these wastes, waste solutions containing cyanide cause a particularly serious problem, threatening both public health and environment. It appears that the best way to minimize the cyanide-containing wastes is to reduce their production in electroplating plants. Numerous techniques have been developed for this purpose, and much experience has been gained by applying such techniques. An expert system, MIN-CYANIDE, has been constructed to assist engineers and technicians in the source reduction of cyanide-waste solutions in an electroplating plant by resorting to these techniques and experience, and to train plant operators in the application of the techniques. MIN-CYANIDE evaluates options, such as dragout minimization, bath-life extension, rinse-water reduction, replacement with a non-cyanide solution, use of an alternative plating technique, and improvement of the operating procedure, furthermore, it identifies the most effective among them. The knowledge about the cyanide source reduction is acquired from available publications, represented by numerous fuzzy or non-fuzzy heuristic rules, and codified into a commercial export system shell, Personal Consultant Plus, on an IBM PC/AT compatible computer. MIN-CYANIDE provides a user-friendly interface, in operating it, the user answers various questions concerning the operational situations of the production and/or current equipment and techniques in the plant. In response, MIN-CYANIDE will present instantaneously a series of options for cyanide minimization and eventually rank them.

Kumar, A., Patel, V. and Shukla, A. (1992), PCCHEMEQ: Prediction of the flue-gas compositions for incinerator and pyrolyzers. *Environmental Progress*, **11** (4), N10-N13.

Full Text: Env Pro11, N10

Jacobs, J.H. (1992), Treatment and stabilization of a hexavalent chromium containing waste material. *Environmental Progress*, **11** (2), 123-126.

Full Text: [1992\Env Pro11, 123.pdf](1992/Env%20Pro11,%20123.pdf)

Abstract: In order to stabilize such wastes, it is necessary to convert the Cr+6 to the trivalent (Cr+3) form, before solidifying the waste through the use of cementitious materials such as portland cement or pozzolime (cement kiln dust). A treatment scheme was developed using ferrous ammonium sulfate (FAS) as reducing agent. With FAS the reaction kinetics are sufficiently rapid at neutral or alkaline pH ranges. With most other reducing agents, such as sodium metabisulfite or ferrous sulfate, it would first be necessary to adjust the pH to about 2 S.U. in order for the reduction reaction to proceed in reasonable time. Bench scale tests were conducted in which the waste material containing about 6,000 mg/kg of Cr+6 and with pH approximately 11 S.U., was reacted with varying doses of FAS at pH levels of 4.5, 7, and as received. The reaction was found to be essentially complete after 3 days and selective for Cr+6 Further tests were conducted in which pozzolime was added to the mixture after the reduction. With an approximately 1: 1 ratio of FAS: waste and pozzolime ratios of between 0.5.: 1 and 1: 1, residual hexavalent chromium and total chromium concentrations were well below 100 mg/kg of waste, which corresponds to the EP Toxicity limit of 5 mg/l. The costs for full-scale FAS/pozzolime stabilization were estimated. Testing of alternative reducing agents, which would require first acidifying with sulfuric acid, was deemed not warranted. The acid quantities required would be costly, and such operations in field conditions were felt to be not prudent.

Peters, R.W. and Shem, L. (1992), Adsorption/desorption characteristics of lead on various types of soil. *Environmental Progress*, **11** (3), 234-240.

Full Text: [1992\Env Pro11, 234.pdf](1992/Env%20Pro11,%20234.pdf)

Abstract: Laboratory studies were conducted to address the phenomena of adsorption/desorption of lead onto various types of soils, both in the absence and presence of the chelating agent, ethylenediaminetetraacetic acid (EDTA). The linear and Freundlich isotherm models provided adequate description of the adsorption/desorption behavior. Over the range of EDTA concentrations employed in the study (0.1 to 0.10M), no significant difference in the isotherm parameters was observed as a result of the applied EDTA concentration. The presence of EDTA significantly altered the adsorption/desorption behavior of lead on the soil, resulting in less of the metal being adsorbed. The soil with the higher silt/clay content had a greater amount of lead adsorbed onto it (as compared with the sandy soil).

Erb, J. (1993), The use of a secondary catalyst bed to increase incinerator destruction efficiency. *Environmental Progress*, **12** (4), 243-245.

Full Text: [1993\Env Pro12, 243.pdf](1993/Env%20Pro12,%20243.pdf)

Abstract: Many incinerators in Texas and the USA are required to achieve 95-99% destruction efficiency. Over time incinerator efficiency may drop due to leaks developing in older equipment, resulting in bypass of catalyst beds or heat exchangers. The use of an additional catalyst bed on the incinerator exhaust stack is an economical way to boost the efficiency back to acceptable levels. The secondary catalyst bed is also efficient in converting CO to CO2 and oxidizing other products of incomplete combustion (PICs).

Following is a case history of a 12 year old incinerator at IBM-Austin which was retrofitted with a secondary catalyst bed and successfully achieved 99% destruction in VOCs and reduction in PICs by an order of magnitude.

Lagnese, K.M. and Dzombak, D.A. (1993), Use of sedimentation ponds for removal of metals from ash transport waters. *Environmental Progress*, **12** (4), 246-256.

Full Text: [1993\Env Pro12, 246.pdf](1993/Env%20Pro12,%20246.pdf)

Abstract: This study investigated the feasibility of using existing ash sedimentation ponds at coal-fired power plants as treatment reactors to reduce concentrations of metals in bottom ash and fly ash transport waters by precipitation and/or adsorption onto iron oxyhydroxide. Intrapond treatment offers economic advantages over construction of a plant for treatment of ash pond effluent. Bench-scale experiments were conducted with bottom ash and fly ash suspensions to investigate pH control and removals of aluminum, manganese, and arsenic under different chemical conditions, including addition of ferric chloride to promote adsoption on iron oxyhydroxide. The effects of pH and iron addition on ash-water partitioning of the metals of interest were studied via batch experiments. In addition, the ability to control pH and promote removal of manganese in an intrapond treatment process was investigated using semi-continuous, bench-scale, pond-simulation reactors. Results of the reactor experiments indicated that the pH could be maintained in range of 8 to 8.5 by dosing the influent with the proper amount of base as determined by batch titration, and that by doing so the influent manganese concentration of 2 ppm could be consistently lowered to less than 0.2 ppm. The effects of accumulation of settled ash were examined in the reactor studies and with the use of a coupled hydraulic/sedimentation model for ash ponds. Overall, results of this study suggest that concentrations of most metals of interest in ash pond water can be kept low with control of pH, in situ precipitation of iron oxyhydroxide, and effective sedimentation of particles. Further examination of the intrapond treatment approach is warranted.

Kumar, A. and Manocha, A. (1994), Environmental resources on the internet. *Environmental Progress*, **13** (2), M12-M21.

Full Text: [1994\Env Pro13, M12.pdf](1994/Env%20Pro13,%20M12.pdf)

Cal, M.P., Larson, S.M. and Rood, M.J. (1994), Experimental and modelled results describing the adsorption of acetone and benzene onto activated carbon fibres. *Environmental Progress*, **13** (1), 26-30.

Full Text: [1994\Env Pro13, 26.pdf](1994/Env%20Pro13,%2026.pdf)

Abstract: Activated carbon fibers (ACF) were used to adsorb ppmv concentrations of volatile organic compounds (VOCs) from laboratory generated gas streams. VOCs considered were benzene and acetone because the VOC are commonly found in indoor air and have potential to increase health risks to humans. ACF were used as the adsorbent because they typically exhibit higher adsorption capacities and faster adsorption kinetics than commercially available granular activated carbons (GAC) and show potential as an adsorbent to effectively remove VOCs from indoor air.

Adsorption models by Dubinin and coworkers (Dubinin, 1975), based on the theory of volume filling of micropores, and an empirical model by Freundlich were used to fit the measured adsorption isotherms. Agreement between the modeled and experimental results for acetone and benzene using the Dubinin-Radushkevich equation generally improved with increasing BET surface area and produced reasonable fits of the adsorption isotherms for both acetone and benzene. The Freundlich equation produced values for correlation coefficients (R) between modeled and experimental data from 0.980 to 0.997, indicating the validity of using the Freundlich equation to model the adsorption isotherms over the concentration range of interest.

These results indicate that ACF show potential as an adsorbent for removing low concentrations of VOCs from indoor air.

Reed, B.E., Arunachalam, S. and Thomas, B. (1994), Removal of lead and cadmium from aqueous waste streams using granular activated carbon (GAC) columns. *Environmental Progress*, **13**, 60-64.

Full Text: [1994\Env Pro13, 60.pdf](1994/Env%20Pro13,%2060.pdf)

Abstract: The use of granular activated carbon (GAC) columns to treat metal-bearing wastewaters was investigated. Synthetic wastewaters containing Pb and Cd (10 or 50 mg/L), acetic acid (0.001 N) or EDTA (1: 0.1 or 1: 1 Me.EDTA molar ratios) were studied. For metal-only and metal-acetic acid experiments, significant quantities (as high as 325 bed volumes (BV)) of wastewater were treated prior to breakthrough (Ce = 0 03 Co). X/M values were as high as about 30 mgPb/g carbon. For EDTA experiments, Ce was always > 0.03 Co. The amount of metal not removed corresponded to the amount that was complexed by EDTA. Column pH is the critical parameter influencing column performance. The increase in effluent metal concentration corresponded with the decrease in column pH. GAO columns were successfully regenerated using a 1 L (≈ 8 BV) 0.1 N HNO3 rinse followed by a 1 L 0.1 N NaOH rinse. Column performance was not adversely affected by regeneration. When the regeneration step was used on virgin carbon, a dramatic improvement in column performance was observed and was attributed to the increase in carbon surface pH (pH ≈ 11) and the deposition of OH-in the pore liquid. Possible removal mechanism are precipitation on the carbon surface and in the pore liquid and adsorption.

Taylor, R.M. and Kuennen, R.W. (1994), Removal of lead in drinking water with activated carbon. *Environmental Progress*, **13** (1), 65-71.

Full Text: [1994\Env Pro13, 65.pdf](1994/Env%20Pro13,%2065.pdf)

Abstract: A point-of-use (POU) granular activated carbon (GAC) fixed bed adsorber (FBA) was evaluated for reduction of soluble and insoluble lead from drinking water. Some of the factors which affect lead removal by GAC were evaluated, such as carbon type, solution pH, and a limited amount of work on competitive interactions. The design criteria for lead reduction by a POU device are also addressed. Minicolumns were used to evaluate the capacity of carbon for lead under a variety of conditions. The importance of surface chemistry of the carbon and the relationship with the pH of the water for lead reduction was demonstrated. Results indicate that a properly designed POU-GA C-FBA can reduce lead in drinking water to below the EPA action level of 15 ppb while being tested under a variety of conditions as specified under the National Sanitation Foundation (NSF) International Standard 53 test protocol.

Deuster, E.V., Mensing, A., Jiang, M.X. and Majdeski, H. (1994), Cleaning of flue-gas from solid-waste incinerator plants by wet semidry process. *Environmental Progress*, **13** (2), 149-153.

Full Text: [1994\Env Pro13, 149.pdf](1994/Env%20Pro13,%20149.pdf)

Abstract: To meet the high demands on the emission limits required by German environmental regulations, well known wet absorption technology using limestone as reagent has been developed and used for specific application in municipal solid waste incineration. This system integrates two independent absorption sections in a single tower, each operating at a different pH. The process ensures the highest removal rate of harmful gases (HCI, SO2, SO3, HF), particulate, and vaporous fumes of heavy metals from the incineration process. The paper discusses the advantages of the wet process.

An improvement on this work has been the development of a combined technology incorporating the advantages of spray dryer and wet scrubbing. This combined technology includes a spray dryer, followed by a suitable particulate collection device, and then by the wet scrubbing stage. The purge stream from the wet scrubbing tower is returned as feed to the spray dryer. The by-product from the combination process is a completely dry powder. As a result, the need for waste water treatment for the wet scrubber purge stream is eliminated. In addition, the combination system allows low cost limestone to be used as a sorbent while providing an easy to handle, free flowing solid by-product.

This paper describes the details of the system process chemistry, criteria of the gas/liquid mass transfer, and presents the results obtained from pilot plants and commercial plants using these alternative processes.

Baukal, C.E., Schafer, L.L. and Papadelis, E.P. (1994), PCB cleanup using an oxygen-fuel-fired mobile incinerator. *Environmental Progress*, **13** (3), 188-191.

Full Text: [1994\Env Pro13, 188.pdf](1994/Env%20Pro13,%20188.pdf)

Abstract: A trial burn was recently conducted at a hazardous waste site containing soil contaminated with PCBs. Simulated soils containing 1 percent PCB and oils containing up to 40 percent PCBs were incinerated. The test results showed that > 99.9999 percent of the PCBs were destroyed in a newly commissioned mobile incinerator incorporating an oxygen-fuel burner in the primary combustion chamber. In addition to the high destruction efficiency, particulates, HCl and CO were all well below the regulatory limits.

Acharya, P., Prabhu, S. and Barkdoll, M. (1995), Estimation of methodology and validation of particulate entrainment in a pilot-scale rotary kiln-based hazardous waste incinerator. *Environmental Progress*, **14** (1), 44-50.

Full Text: [1995\Env Pro14, 44.pdf](1995/Env%20Pro14,%2044.pdf)

Abstract: Combustion gas particulate entrainment from rotary kiln hazardous waste incinerators (HWI) is a necessary design data requirement because of its impact on the design and operation of the downstream process equipment. The particulate leaving the rotary kiln off-gases may slag in the secondary combustion chamber (SCC). The potential to slag and the problems slagging can cause are dependent upon the SCC burner design, the mineralogical composition of the praticulate, and the SCC operating temperature.

Some entrained particulate may adhere to the walls or fall out in the SCC as a dust/slag, the remainder of the particulates will be conveyed by the flue gas to the downstream air pollution control (APC) system. If a wet APC system is used, the particulates would be discharged to a wastewater treatment system (WTS) or publicly operated treatment works (POTW).

A literature search was conducted to determine the knowledge base for particulate carry-over from a countercurrent rotary kiln processing sedimentary solids. No data existed for this type soil. A pilot test was, therefore, conducted to experimentally measure the potential entrainment rate of this material. A detailed discussion of the entrainment mechanisms, pilot test equipment, sampling procedure, test conditions simulating the commercial operation, particle size distribution (PSD) of the ash sample, percent carry-over rate, and measured PSD of the kiln particulate carry-over are presented in this article. A mathematical model was developed by the authors to predict the pilot test results. The PSD of incinerator ash was used to calculate percent carry-over rate and PSD of the entrained solids. A comparison of experimental versus estimated results for estimating entrainment are presented in this article.

? Lu, G.Q. (1996), Preparation and evaluation of adsorbents from waste carbonaceous materials for SOx and NOx removal. *Environmental Progress*, **15** (1), 12-18.

Full Text: [1996\Env Pro15, 12.pdf](1996/Env%20Pro15,%2012.pdf)

Abstract: This paper presents studies of a new integrated process for simultaneous SOx and NOx removal and utilization of waste carbonaceous materials. It is mainly centered on some fundamental aspects of preparing microporous adsorbents from solid wastes such as coal reject, sewage sludge and sawdust. Surface area and pore structural evolution are investigated to illustrate the importance of processing parameters such as pyrolysis temperature and hold rime, activation methods and carbon burn-off etc. It is shown that pyrolysis temperature, activation chemicals used and carbon bum-off have significant effects on the surface area development and pore structure evolution. There exist an optimal pyrolysis temperature and hold time for maximum surface area development for all precursor materials. Physical activation of coal reject char after pyrolysis can improve the surface area of the derived chars, while chemical treatment ii? ZnCl2 can enhance the microporosity of sewage sludge char. In physical activation, carbon burn-off or hold time is a critical factor in determining the surface area. Concentration of the activating agent is an important factor in chemical treatment of sewage sludge. Adsorption characteristics of the wastes-derived adsorbents with respect to SO2, H2S, and NOx are also studied in this work. It is shown that solid wastes such as sawdust and coal mining wastes can be converted into effective adsorbents for SO2 and NOx removal from flue gases whilst activated chars derived from sewage sludge have been shown to be promising adsorbents for H2S removal, The significance of using waste solids is two-fold on one hand the waste materials are utilized or minimized, on the other, they can replace or partially substitute the expensive activated carbons for the removal of SOx and NOx

Keywords: Activated Carbons, Activation, Adsorbents, Char, Pyrolysis, Reject, Removal, Sawdust, Surface Area, Waste Materials

Kumar, A. and Vashisth, S. (1997), Interoduction to environmental business on World Wide Web. *Environmental Progress*, **16** (1), S11-S15.

Full Text: [1997\Env Pro16, S11.pdf](1997/Env%20Pro16,%20S11.pdf)

Deorkar, N.V. and Tavlarides, L.L. (1998), An adsorption process for metal recovery from acid mine waste: The Berkeley Pit problem. *Environmental Progress*, **17** (2), 120-125.

Full Text: [1998\Env Pro17, 120.pdf](1998/Env%20Pro17,%20120.pdf)

Abstract: An adsorption process comprised of inorganic chemically active adsorbents (ICAAs) has been developed for recovery of Fe(III), Cu(II), Zn(II), Cd(II) and Pb(II) from acid mine drainage solutions similar to the Berkeley Pit near Butte, Montana. ICAAs are prepared by immobilization of chelating agents on the ceramic supports. The detailed laboratory-scale studies are executed to determine selectivity and operating conditions of each each ICAA for individual metal ions. This paper presents results of separation studies using several ICAAs materials with simulated acid mine drainage solutions similar to the Berkeley Pit. Three most suitable ICAA materials have the potential to remove and recover desired metal ions from acidic streams without neutralization. Accordingly, an integrated adsorption process with three independently operating stages can be devised. Three fixed-bed adsorbers, comprised of ICAA (A), ICAA (C), and ICAA (D), selectively removed Fe(III), Cu(II), and Zn(II) Cd(II) and Pb(II) respectively, from the acidic stream. In addition, the last bed comprised of ICAA (D), acts as an acid scavenger and increases the pH of the effluent to greater than 7, which can then be discharged in an environmentally saFemanner The adsorbed metal ions can be recovered as pure metalsalts by stripping with sulfuric acid, and the regenerated bed can then be used for future cycles.

? de Hoces, M.C., de Castro, F.H.B., García, G.B. and Rivas, G.T. (2006), Equilibrium modeling of removal of cadmium ions by olive stones. *Environmental Progress*, **25** (3), 261-266.

Full Text: [2006\Env Pro25, 261.pdf](2006/Env%20Pro25,%20261.pdf)

Abstract: This article addresses the equilibrium for cadmium biosorption using olive stones as a sorbent material over a range of temperatures between 25 and 80°C Three models frequently used in the literature-Langmuir, Freundlich, and Redlich-Peterson-were examined to describe these equilibrium data. The experimental results fit Langmuir’s model for the majority of temperatures tested. The maximal biosorption capacity, q(m), increases with temperature, rising from 4.52 mg/g at 25°C to 9.72 mg/g at 80°C Also, the affinity of olive stones for cadmium, represented by parameter b in Langmuir’s model, increases when the temperature is raised from 25 to 80°C. Finally, the shape of Langmuir’s model, represented by the dimensionless parameter K-R, shows that cadmium biosorption with olive stones works well at the temperatures and initial cadmium concentrations tested in this study.

Keywords: Sorption, Equilibrium, Cadmium, Olive Stones, Aqueous-Solutions, Tree Fern, Heavy-Metals, Biosorption, Sorption, Adsorption, Products, Isotherm, Kinetics

? Özdemir, M. and Kıpçak, İ. (2007), Recovery of boron from borax sludge using solid-liquid extraction followed by ion exchange with amberlite resin. *Environmental Progress*, **26** (2), 157-163.

Full Text: [2007\Env Pro26, 157.pdf](2007/Env%20Pro26,%20157.pdf)

Abstract: To recover boron from borax sludge, initially solid-liquid extraction with dilute su ulfuric acid was utilized in a batch reactor. The optimum working conditions for boron extraction were determined. A maximum extraction yield of 85.0% for boron was obtained. In the process, 9.14% of the calcium and 16.8%, of the magnesium contained in the solid waste passed to the extraction solution. Subsequently, batch ion-exchange studies were performed using Amberlite IRA- 743-boron specific resin 7 for the separation of boron from the calcium and magnesium components in the exo-action solution. The effects of contact time and resin dosage on the ion-exchange process were investigated. A second order kinetic model seemed to be appropriate for the boron ion-exchange. The boron, which was sorbed on the resin. was eluted completely using a 0.5 M sulfuric acid solution. It was seen that the calcium and magnesium components were not present in the elution solution. In this process. boron was succesfully separated from the calcium and magnesium species. It was determined that approximately 98-70% of the boron in the extraction solution could be recovered at a pH value of 8. a contact time of 24 h, an initial boron concentration of 500 mg/L a resin dosage of 2.5 g of resin/50 mL of extraction solution and a temperature of 25°C. (C) 2007 American institute of Chemical Engineers Environ Prog, 26: 157-163, 2007.

Keywords: Acid, Adsorption, Amberlite, Amberlite IRA-743, Batch, Batch Reactor, Borax Recovery, Boron, Calcium, Concentration, Contact Time, Dosage, Effects, Elution, Extraction, Industrial-Waste, Ion, Ion Exchange, Ion-Excbange, Ion-Exchange, Kinetic, Kinetic Model, Magnesium, Model, Order, pH, Process, Reactor, Removal, Resin, Second Order, Separation, Sludge, Solid Waste, Solid-Liquid Extraction, Sorbed, Sorption, Species, Sulfuric Acid, Temperature, Time, Waste, Water, Working Conditions, Yield

? Long, X.L., Cheng, H., Xin, Z.L., Xiao, W.D., Li, W. and Yuan, W.K. (2008), Adsorption of ammonia on activated carbon from aqueous solutions. *Environmental Progress*, **27** (2), 225-233.

Full Text: [2008\Env Pro27, 225.pdf](2008/Env%20Pro27,%20225.pdf)

Abstract: In this study, adsorption of ammonia on activated carbon from aqueous solutions has been studied in a batch stirred cell. Experiments have been carried out to investigate the effects of temperature, ammonia concentration, and activated carbon dose on ammonia adsorption. The experimental results manifest that the ammonia adsorption rate on activated carbon increases with its concentration in the aqueous solutions. Ammonia adsorption also increases with temperature. The ammonia removal from the solution increases as activated carbon mass increases. The Langmuir and Freundlich equilibrium isotherm models are found to provide a good fitting of the adsorption data, with r(2) = 0.9749 and 0.9846, respectively. The adsorption capacity of ammonia obtained from the Laugmuir equilibrium isotherm model is found to be 17.19 mg g-1. The kinetic study shows that ammonia adsorption on the activated carbon is in good compliance with the pseudo-second-order kinetic model. The thermodynamic parameters (ΔG°, ΔH°, ΔS°) obtained indicate the endothermic nature of ammonia adsorption on activated carbon. (C) 2008 American Institute of Chemical Engineers Environ Prog.

Keywords: Activated Carbon, Adsorption, Adsorption Capacity, Adsorption Kinetics, Adsorption Rate, Ammonia Activated Carbon, Ammonia Removal, Aqueous Solutions, Capacity, Carbon, Compliance, Endothermic, Equilibrium, Equilibrium Isotherm, Experimental, Freundlich, Gas, Isotherm, Isotherm Model, Kinetic, Kinetic Model, Kinetic Study, Kinetics, Langmuir, Model, Models, NH3, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Solution, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters

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? Coruh, S. and Ergun, O.N. (2009), Ni2+ Removal from aqueous solutions using conditioned clinoptilolites: Kinetic and isotherm studies. *Environmental Progress & Sustainable Energy*, **28** (1), 162-172.

Full Text: [2009\Env Pro Sus Ene28, 162.pdf](2009/Env%20Pro%20Sus%20Ene28,%20162.pdf)

Abstract: The aim of this study is to investigate the effects of conditioning with NaCl and HCl solutions on removal of Ni2+ ions from aqueous solutions using natural clinoptilolite. Batch studies were performed to evaluate the effects of various parameters such as chemically conditioning, adsorbent amount, contact time, initial pH of the solution, mixing temperature, and initial metal ions. The results clearly showed that the conditioning improved both the exchange capacity and the removal efficiency. Langmuir, Freundlich, Temkin, and Dubinin-kaganer-Radush-kevich (DKR) isotherm models were adopted to describe the adsorption isotherms. Adsorption isotherms of Ni2+ ions could be best modeled by Langmuir equation. Three simplified models including pseudo-second-order, intraparticle diffusion and Elovic were used to test the adsorption kinetics. These results indicate a significant potential for the natural and conditioned clinoptilolites as an adsorbent/io-exchange material for heavy metal removal. (C) 2008 American Institute of Chemical Engineers Environ Prog, 28: 162-172, 2009.

Keywords: Adsorbent, Adsorption, Adsorption, Adsorption Isotherms, Adsorption Kinetics, Aqueous Solutions, Capacity, Clinoptilolite, Clinoptilolites, Conditioning, Copper, Diffusion, Efficiency, Exchange, Freundlich, Heavy Metal, Heavy Metal Removal, Heavy-Metal Removal, Intraparticle Diffusion, Ion-Exchange, Ions, Ions Removal, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Equation, Lead Removal, Metal, Metal Ions, Mixing, Models, NaCl, Natural, Natural Zeolites, Ni2+, Nickel, Nickel Removal, pH, Potential, Pseudo Second Order, Pseudo-Second-Order, Removal, Removal Efficiency, Solution, Solutions, Temperature, Waste-Water, Zinc

? Naiya, T.K., Bhattacharya, A.K. and Das, S.K. (2009), Adsorptive removal of Cd(II) ions from aqueous solutions by rice husk ash. *Environmental Progress & Sustainable Energy*, **28** (4), 535-546.

Full Text: [2009\Env Pro Sus Ene28, 535.pdf](2009/Env%20Pro%20Sus%20Ene28,%20535.pdf)

Abstract: This study deals with the adsorption characteristics of Cd(II) onto rice busk ash, low valued agricultural by-product obtained during the rice processing from rice mill. The influences of pH, contact time, initial metal ion concentration, adsorbent concentration on the selectivity and sensitivity of the removal process were investigated. The optimum pH for adsorption was found to be 5 for Cd(II), and equilibrium? was achieved within 2 h of contact time. Maximum adsorption of Cd(II) was obtained at an adsorbent dosage of 7.5 g/L, which may be considered as optimum? adsorbent dosage level,. Kinetics data were best described by pseudo-second order model. The value of effective diffusion coefficient was of the order of 10(-10) m2/S. The equilibrium adsorption data were better fitted to Freundlich isotherm models. The adsorption capacity (*q*max) of rice husk ash for Cd(II) ions in terms of monolayer adsorption was 35.84 mg/g. The thermodynamic equilibrium constant and the Gibbs free energy were determined for and results indicated the spontaneous nature of the adsorption process. The adsorption energy calculated Using Dubinin-Radushkevich isotherm shows that adsorption of Cd(II) is chemical in nature. (C) 2009 American institute of Chemical Engineers Environ Prog, 28: 535-546, 2009.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacity, Agricultural, Agricultural By-Product, Bagasse Fly-Ash, Biosorption, Cadmium, Capacity, Cd(II), Cd(II) Ions, Characteristics, Chemical, Chemisorption, Chromium, Concentration, Contact Time, Data, Diffusion, Diffusion Coefficient, Energy, Equilibrium, Freundlich, Freundlich Adsorption Isotherm, Freundlich Isotherm, Gibbs Free Energy, Heavy-Metals, Ions, Isotherm, Isotherm Models, Kinetics, Lead, Metal, Metal Ion, Model, Models, Monolayer, pH, Pseudo Second Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Removal, Rice, Rice Husk, Rice Husk Ash, Rice-Husk, Selectivity, Sensitivity, Sorption, Spontaneous, Thermodynamic, Value, Waste

? Uğurlu, M., Kula, I., Karaoğlu, M.H. and Arslan, Y. (2009), Removal of Ni(II) ions from aqueous solutions using activated-carbon prepared from olive stone by ZnCl2 activation. *Environmental Progress & Sustainable Energy*, **28** (4), 547-557.

Full Text: [2009\Env Pro Sus Ene28, 547.pdf](2009/Env%20Pro%20Sus%20Ene28,%20547.pdf)

Abstract: The aim of this study is to remove Ni (II) ions from aqueous solutions by adsorption. Activated-carbon prepared from olive stone (ACOS) was used as adsorbent. Different particle size and concentration of ZnCl2 were studied to optimize adsorbent surface area. Initial concentration, temperature, time, and pH were selected as parameters. According to the experiments results, the equilibrium time, optimum pH, and adsorbent dosage were found 60 min, pH > 6, and 1.0 g/50 mL, respectively. In addition, raw olive stone was used as adsorbents at the same parameters. Nickel removal percentage for ACOS and Raw Olive stone were obtained 95.00% and 38.00% in turn. The kinetic data supports pseudo-second-order model strongly. In addition, the thermodynamic parameters ΔGº, ΔHº, and ΔSº were found -6.185 kJ mol-1, -10.997 kJ mol-1, and -15.889 J/mol K, respectively. Scanning electron microscopy (SEM-EDX) technique was employed to observe the surface physical morphology and structural analysis. The resulting activated carbons with 20% ZnCl2 solution was the best sample of the produced activated-carbons from olive stone with the specific surface area of 790.25 m2g-1. The results indicated that ACOS could be employed as an alternative adsorbent for removing Ni (II). (C) 2009 American Institute of Chemical Engineers Environ Prog, 28, 547-557, 2009.

Keywords: Activated Carbon, Activated Carbons, Activation, Adsorbent, Adsorbent Dosage, Adsorbents, Adsorption, Adsorption Characteristics, Alternative, Analysis, Aqueous Solutions, Concentration, Data, Electron Microscopy, Equilibrium, Experiments, Fly-Ash, Heavy-Metals, Initial Concentration, Ions, Kinetic, Kinetics, Mill Effluent, Model, Morphology, Ni(II), Nickel, Nickel, Nickel Removal, Olive Stone, Particle Size, Pb(II) Ions, pH, Physical, Pine Bark Wastes, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, SEM-EDX, Size, Solution, Solutions, Sorption, Specific Surface, Specific Surface Area, Surface, Surface Area, Temperature, Textile Dyeing Effluent, Thermodynamic, Thermodynamic Parameters, ZnCl2

? Senthilkumar, R., Vijayaraghavan, K., Jegan, J. and Velan, M. (2010), Batch and column removal of total chromium from aqueous solution using *Sargassum polycystum*. *Environmental Progress & Sustainable Energy*, **29** (3), 334-341.

Full Text: [2010\Env Pro Sus Ene29, 334.pdf](2010/Env%20Pro%20Sus%20Ene29,%20334.pdf)

Abstract: A marine brown alga, *Sargassum polycystum*, showed high-chromium biosorption capacity in batch and column mode of operation. The biosorbent performance was strongly influenced by equilibrium solution pH, with pH 2 as optimal condition for Cr biosorption. Isotherm experiments revealed that S. polycystum possessed a maximum chromium uptake of 69.4 mg/g at pH 2. The pseudo-second order model was found to describe the chromium kinetic biosorption data with high-correlation coefficients compared with pseudo-first order model. Various thermodynamic parameters, such as Δ*G*º, Δ*H*º, and Δ*S*º, were calculated, indicating that the present system was a spontaneous and endothermic process. A packed column was used to study the continuous chromium biosorption performance of S. polycystum. The biosorbent performance was evaluated at different bed heights (15-25 cm) and flow rates (5-15 mL/min). Favorable conditions for Cr biosorption were observed at the highest bed height (25 cm) and lowest flow rate (5 mL/min); at which the Cr uptake and percent removal were recorded as 29.1 mg/g and 63.3%, respectively. Mathematical modeling of column experimental data was performed, using nonlinear forms of the Thomas and modified-dose-response models; with the latter able to describe the breakthrough curves with high-correlation coefficients. (C) 2010 American Institute of Chemical Engineers Environ Prog, 29: 334-341, 2010.

Keywords: 2-Parameter, Adsorption, Batch, Biomass, Biosorbent, Biosorption, Biosorption, Breakthrough, Breakthrough Curves, Brown Alga, Capacity, Chromium, Column, Cr(VI), Data, Endothermic, Equilibrium, Experimental, Experiments, Flow, Flow Rate, Forms, Heavy-Metals, Hexavalent Chromium, Isotherm, Kinetic, Kinetics, Mode, Model, Modeling, Models, Operation, Packed Column, Performance, pH, Pseudo First Order, Pseudo Second Order, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Model, Pseudo-Second-Order, Rates, Removal, Sargassum, Solution, Sorption, Thermodynamic, Thermodynamic Parameters, Uptake, Waste-Water, Wastewater Treatment, Wastewaters

? Malkoc, E. and Nuhoglu, Y. (2010), Nickel(II) adsorption mechanism from aqueous solution by a new adsorbent-waste acorn of Quercus ithaburensis. *Environmental Progress & Sustainable Energy*, **29** (3), 297-306.

Full Text: [2010\Env Pro Sus Ene29, 297.pdf](2010/Env%20Pro%20Sus%20Ene29,%20297.pdf)

Abstract: This article presents the data for the effect of adsorbent dose, initial metal concentration, solution pH, agitating rate, and temperature on the adsorption of nickel(II) on waste of acorn. Batch adsorption studies have been carried out. Adsorption equilibrium was approached within 30-60 min. The nature of the possible adsorbent and metal ion interactions were examined by the FTIR technique. The maximum nickel(II) adsorption is noted at pH 5.0. The experimental isotherm data were analyzed using the Langmuir, Freundlich, and Temkin equations. The equilibrium data fit well the Langmuir isotherm. The adsorption capacity (Q(o)) calculated from Langmuir isotherm was 9.42 mg g-1 at initial pH of 5.0 at 60ºC. The adsorption of nickel(II) on waste of acorn increased from 7.68 to 9.1 mg g-1 when temperature was increased from 25 to 60ºC at an initial concentration of 200 mg L-1. The adsorption of nickel(II) ions increased with increasing temperature indicating endothermic nature of the adsorption process. Various thermodynamic parameters, such as Delta G degrees, Delta H degrees, and Delta S degrees have been calculated. The thermodynamics of nickel(II) ion onto waste of acorn system indicates spontaneous and endothermic nature of the process. The pseudo first and second-order kinetic models were used to describe the kinetic data, and the rate constants were evaluated. The experimental data were fitted by the second-order kinetic model, which indicates that chemical sorption is the rate limiting step, inside of mass transfer. (C) 2010 American Institute of Chemical Engineers Environ Prog, 29: 297-306, 2010.

Keywords: Adsorbent, Adsorbent Dose, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Adsorption Isotherms, Batch, Batch Adsorption, Biomass, Biosorption, Capacity, Chemical, Chromium(VI), Concentration, Data, Endothermic, Equilibrium, Experimental, First, Freundlich, FTIR, Heavy-Metals, Ions, Isotherm, Kinetic, Kinetic Model, Kinetic Models, L1, Langmuir, Langmuir Isotherm, Mass Transfer, Mechanism, Metal, Model, Models, Nickel(II), Nickel(II) Ion, Nickel(II) Ions, pH, Rate Constants, Rate Limiting Step, Recovery, Removal, Sawdust, Second Order, Second-Order, Solution, Sorption, Temkin, Temperature, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Waste, Waste Acorn

? Yan, C.Y. and Yi, W.T. (2010), Preparation, Characterization, and boron adsorption behavior of gluconate-intercalated hydrotalcite. *Environmental Progress & Sustainable Energy*, **29** (4), 450-456.

Full Text: [2010\Env Pro Sus Ene29, 450.pdf](2010/Env%20Pro%20Sus%20Ene29,%20450.pdf)

Abstract: Gluconate-intercalated hydrotalcites were prepared from precursor by ion-exchange method. The products were characterized by X-ray diffraction (XRD). Fourier transform infrared spectroscopy (FTIR), and energy dispersive spectroscopy (EDS) studies. This kind of new adsorbent was applied to adsorb boron in the refined brine, and the conditions influencing its adsorption amount were investigated. The experimental results showed that the adsorbent synthesized in this article had higher adsorption amount of boron than the precursor without gluconate intercalation, and the adsorption amount increased with increasing the contact time boron concentration; and the pH whereas decreased with increasing chloride concentration and temperature. The adsorbent can be well regenerated by calcination and reintercalation of the gluconate into the calcinated product. Furthermore, the kinetic studies were also investigated. The pseudo-first-order pseudo-second-order and intraparticle diffusion models were used to fit the experimental data, and the results showed that the pseudo-first-order model best described the boron adsorption process. (C) 2010 American Institute of Chemical Engineers Environ Prog, 29: 450-456, 2010.

Keywords: Adsorbent, Adsorption, Anion, Boron, Boron Adsorption, Characterization, Contact Time, Data, Diffusion, Fourier Transform Infrared, Fourier Transform Infrared Spectroscopy, FTIR, Gluconate-Intercalated Hydrotalcite, Hydrotalcite, Infrared, Intraparticle Diffusion, Ion Exchange, Ion-Exchange, Kinetic, Layered Double Hydroxide, Model, Models, pH, Precursor, Preparation, Process, Pseudo Second Order, Pseudo-Second-Order, Removal, Seawater, Temperature, X-Ray, X-Ray Diffraction, XRD

? Maiti, A., Basu, J.K. and De, S. (2010), Removal of arsenic from synthetic and natural groundwater using acid-activated laterite. *Environmental Progress & Sustainable Energy*, **29** (4), 457-470.

Full Text: [2010\Env Pro Sus Ene29, 457.pdf](2010/Env%20Pro%20Sus%20Ene29,%20457.pdf)

Abstract: Acid-activated laterite (AAL) is used to remove arsenic from synthetic and natural groundwater Physicochemical characteristics of AAL, such as BET (Brunauer-Emmett-Teller) surface area, pore volume, pore volume distribution, zero point of charge, and chemical composition, are studied and compared with raw laterite (RL). The BET surface area and pore volume of AAL are obtained as 45.4±2.7 m(2) g(-1) and 0.063±0.007 mL g(-1), respectively. Zero point of charge of AAL is found to be 5.70±0.22. Arsenite and arsenate adsorption on AAL are examined under varying process parameters such as adsorbent dose, contact time, temperature, particle size, initial arsenic concentration, and competitive ions in batch mode. Arsenic adsorption capacity of AAL increases by two- to threefold compared with RL. The kinetic data fit better to pseudo-second-order model. Transport properties, such as external mass transfer coefficient and effective pore diffusivity of arsenic species, are obtained from shrinking core model fit to experimental kinetic data. Continuous fixed bed column mode adsorption of arsenic on AAL is performed. About 200 bed volume (21 L) of arsenic contaminated groundwater (total arsenic: 378±8.9 mu g L-1) has been treated at a breakthrough concentration of 50 mu g L-1. of arsenic by using column height of 20 cm (weight of adsorbent: 125 g). (C) 2010 American Institute of Chemical Engineers Environ Prog, 29: 457-470, 2010.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Aqueous-Solutions, Arsenate, Arsenate Adsorption, Arsenic, Arsenic Adsorption, Arsenic-Contaminated Groundwater, Arsenite, Basic Dye, Batch, Batch Mode, BET, BET Surface Area, Breakthrough, Capacity, Chemical Composition, Clay-Minerals, Contact Time, Data, Groundwater, Heavy-Metals, Kinetic, Kinetics, Laterite, Mass Transfer, Model, Montmorillonite, Palygorskite, Pore, Pore Volume, Pore Volume Distribution, Process, Properties, Pseudo Second Order, Pseudo-Second-Order, Removal, Shrinking Core Model, Soil, Sorption, Sorption, Surface Area, Temperature, Transport, Volume, Weight

? Shah, B.A., Shah, A.V., Singh, R.R. and Patel, N.B. (2011), Reduction of Cr(VI) in electroplating wastewater and investigation on the sorptive removal by WBAP. *Environmental Progress & Sustainable Energy*, **30** (1), 59-69.

Full Text: [2011\Env Pro Sus Ene30, 59.pdf](2011/Env%20Pro%20Sus%20Ene30,%2059.pdf)

Abstract: The aim of the present investigation was to study the removal of total chromium from the electroplating industry effluent using Weathered Basalt Andesite Products (WBAP). The reduction of Cr(VI) to Cr(III) by hydrazinium sulfate (HS) was adopted. The sorbent WBAP before and after sorption, was characterized by FTIR, X-ray diffraction, SEM, TEM, and TGA methods. The effects of various parameters such as hydronium ion concentration, shaking time, sorbent dose, initial metal ion concentration, and temperature on the removal of Cr(III) from aqueous solution was studied. Thermodynamic parameters (ΔH, ΔS, and ΔG) for the sorption process were evaluated. Freundlich, Langmuir, and Dubinin-Kaganer-Radushkevich isotherm models were examined to describe the sorption isotherms. Analysis of sorption results obtained showed that the sorption pattern followed the Freundlich sorption isotherm. Langmuir maximum sorption capacity of WBAP for Cr(III) was found to be 12.07 mg/g. The process follows Pseudo second order rate and surface diffusion is identified as the predominating mechanism. The effluent having average discharge of total chromium 90 mg/L was successfully treated with the same sorbent with a removal of 85.65%. (C) 2010 American Institute of Chemical Engineers Environ Prog, 30: 59-69, 2011.

Keywords: Adsorption, Aqueous-Solutions, Biomass, Biosorption, Chromium, Clay, Cr, Freundlich, FTIR, Hexavalent Chromium, Ions, Isotherm, Isotherms, Kinetics, Langmuir, Natural Adsorbent, Removal, Sorption, Surfaces, Thermodynamic, VI, Wastewater

? Kuleyin, A. and Aydin, F. (2011), Removal of reactive textile dyes (Remazol Brillant Blue R and Remazol Yellow) by surfactant-modified natural zeolite. *Environmental Progress & Sustainable Energy*, **30** (2), 141-151.

Full Text: [2011\Env Pro Sus Ene30, 141.pdf](2011/Env%20Pro%20Sus%20Ene30,%20141.pdf)

Abstract: In this study, surfactant-modified zeolite (SMZ) was used to remove Remazol Brillant Blue R and Remazol Yellow reactive dyes from aqueous solutions. The influences of suspension pH, temperature, agitation rate, and the SMZ dosage on reactive dyes removal and adsorption capacity were investigated by conducting a series of batch adsorption experiments. The adsorption kinetics was tested for pseudo-first-order, pseudo-second order, intraparticle diffusion model, Elovich, and Bangham models, and rate constants of the kinetic models were calculated. Equilibrium isotherms for the adsorption of reactive dyes were analyzed by the Freundlich, Langmuir, Dubinin-Radushkevich, and Tempkin isotherm models. The Langmuir monolayer adsorption capacities of Remazol Brillant Blue R and Remazol Yellow were estimated as 13.9 and 38.31 mg/g, respectively. The adsorption rate was rapid; more than half of the adsorbed Remazol Brillant Blue R was removed in the first 60 min and of Remazol Yellow in the first 30 min. Thermodynamic parameters such as Delta H(0), Delta S(0), and Delta G(0), at 20 degrees C, were found to be 5.2126 kJ/mol, 0.0273 kJ/mol K, and -2.7969 kJ/mol (Remazol Brillant Blue R), and 29.9747 kJ/mol, 0.10875 kJ/mol K, and -1.8900 kJ/mol (Remazol Yellow), respectively. (C) 2010 American Institute of Chemical Engineers Environ Prog, 30: 141-151, 2011.

Keywords: Activated Carbon, Adsorption, Adsorption Kinetics, Aqueous-Solutions, Azo Dyes, Bagasse-Fly-Ash, Basic Dye, Diffusion, Equilibrium Isotherm, Isotherm, Kinetics, Methylene-Blue, Model, Modification, Organo-Zeolite, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Reactive Dye, Sorption Kinetics, Thermodynamic, Thermodynamic Parameters, Zeolite

? Turan, N.G. (2011), Metal uptake from aqueous leachate of poultry litter by natural zeolite. *Environmental Progress & Sustainable Energy*, **30** (2), 152-159.

Full Text: [2011\Env Pro Sus Ene30, 152.pdf](2011/Env%20Pro%20Sus%20Ene30,%20152.pdf)

Abstract: The objective of this research was to identify Cu (II) and Zn (II) ions in the litter aqueous leachate and to take up these metals from leachate using natural zeolite. The adsorption capacities and sorption efficiencies were determined. The sorption efficiencies increased with increasing natural zeolite ratio. The pseudo first-order, the pseudo second-order, Elovich, and the intraparticle diffusion kinetic models were used to describe the kinetic data to estimate the rate constants. The second-order model best described adsorption kinetic data. The results indicated that natural zeolite showed excellent adsorptive characteristics for the removal of Cu (II) and Zn (II) from aqueous leachate of poultry litter and could be used as additive materials for poultry litter due to its high uptake capacity and the abundance in availability. (C) 2010 American Institute of Chemical Engineers Environ Prog, 30: 152-159, 2011.

Keywords: Adsorbent, Adsorption, Basic Dye, Competitive Adsorption, Composts, Copper, Diffusion, Equilibrium, Heavy Metals, Ions, Kinetics, Leachate, Livestock, Model, Natural Zeolite, Poultry Litter, Pseudo-First-Order, Pseudo-Second-Order, Removal, Research, Sorption, Sorption, Zeolite

? Danis, U. (2011), Kinetic and thermodynamic studies of the biosorption of Cu(II) by *Agaricus campestris*. *Environmental Progress & Sustainable Energy*, **30** (2), 177-186.

Full Text: [2011\Env Pro Sus Ene30, 177.pdf](2011/Env%20Pro%20Sus%20Ene30,%20177.pdf)

Abstract: Agaricus campestris was used as an adsorbent for the adsorption of Cu(II) ions in water. The adsorption process was carried out in a batch process and the effects of contact time, initial pH, initial Cu(II) ion concentration, adsorbent amount, and temperature on the adsorption were investigated. Kinetic calculation results from the recent experiments showed that the amount of adsorbed Cu(II) increased with increasing Cu(II) concentration, pH, temperature, contact time and with decreasing adsorbent amount. Pseudo-second-order reaction model provided the best description of the data with a correlation coefficient 0.99-1 for different initial metal concentrations and temperatures were studied. The equilibrium data were well fitted to the Langmuir isotherm. The maximum adsorption capacity for Cu(II) was 32.52 mg g(-1) at 298 K. Thermodynamic parameters such as Delta H(0), Delta S(0) and Delta G(0) were calculated. The adsorption process was found to be endothermic and spontaneous. (C) 2010 American Institute of Chemical Engineers Environ Prog, 30: 177-186, 2011.

Keywords: Adsorption, Adsorption Kinetics, Agaricus Campestris, Aqueous-Solutions, Biomass, Biosorption, Copper Biosorption, Cu(II), Equilibrium, Heavy-Metals, Ions, Ions, Isotherm, Langmuir Isotherm, Model, Pb(II), Powdered Waste Sludge, Removal, Thermodynamic, Water

? Argun, M.E. and Karatas, M. (2011), Application of Fenton process for decolorization of Reactive Black 5 from synthetic wastewater: Kinetics and thermodynamics. *Environmental Progress & Sustainable Energy*, **30** (4), 540-548.

Full Text: [2011\Env Pro Sus Ene30, 540.pdf](2011/Env%20Pro%20Sus%20Ene30,%20540.pdf)

Abstract: The decolorization and degradation efficiency of the azo dye Reactive Black 5 (RB5) by Fenton system were investigated in this study. The operation parameters such as Fe2+:H2O2 ratio, pH value, initial concentration of RB5, reaction time, and temperature were examined. Maximum decolorization (99%) and degradation (88% COD removal) efficiencies were achieved at the Fe2+:H2O2 ratio of 0.05 and pH 3 for 15-min reaction time. The decolorization kinetic of RB5 followed pseudo-second-order reaction kinetic. The increase of temperature caused decreasing of obtained rate constants and increasing of corresponding half-lives. The article also discussed thermodynamic parameters including changes in Gibbs free energy, enthalpy, and entropy for the decolorization of RB5 by Fenton and exposed that the oxidation process was spontaneous and exothermic under natural conditions. (c) 2010 American Institute of Chemical Engineers Environ Prog, 2010.

Keywords: Adsorption, Aqueous-Solution, Azo-Dye, Combination, Decolorization, Degradation, Fenton Process, Hydrogen-Peroxide, Irradiation, Kinetic, Kinetics, Orange, Oxidation Process, pH, Reactive Black 5, Removal, Thermodynamics

? Dundar, M., Nuhoglu, C. and Nuhoglu, Y. (2011), Biosorption of Cr(VI) onto the litter of natural trembling poplar forest. *Environmental Progress & Sustainable Energy*, **30** (4), 599-608.

Full Text: [2011\Env Pro Sus Ene30, 599.pdf](2011/Env%20Pro%20Sus%20Ene30,%20599.pdf)

Abstract: Batch biosorption experiments onto the litter of natural trembling poplar (Populus tremula) forest (LNTPF) were investigated for the biosorption of chromium(VI) ions from aqueous solutions. The influence of different experimental parameters such as initial pH, particle size, agitating speed, initial Cr(VI) concentration (C0), adsorbent concentration (m), and temperature on chromium(VI) ion removal were evaluated. The efficiency of chromium(VI) removal increases with a rise of adsorbent concentration, agitating speed, temperature, and with a fall of solution pH, particle size, and initial Cr(VI) concentration. The optimum biosorption conditions were determined as pH = 2.0, particle size =0.15 mm, agitating speed = 300 rpm, C0 = 30 mg L-1, m = 10 g L-1, and T = 45°C. The equilibrium was reached at around 150 min. The biosorption kinetics showed the pseudo-second-order model better than the pseudo-first-order model. Kinetic studies showed that the biosorption process was an endothermic process. The experimental biosorption data were fitted to the Freundlich biosorption model. The maximum biosorption capacity was found to be 16.97 mg g-1 removed by raw adsorbent. Electron paramagnetic resonance studies combined with FTIR spectroscopy were used to represent the biosorption mechanism. These studies display new remarkable findings. (c) 2010 American Institute of Chemical Engineers Environ Prog, 2010.

Keywords: Activated Carbon, Adsorbent, Adsorption, Aqueous-Solution, Biomass, Biosorption, Biosorption Mechanism, Cr(VI), Cu(II) Ions, Forest Litter, Freundlich, FTIR, Heavy-Metals, Industrial-Waste, Kinetic, Kinetic Studies, Kinetics, Orange Waste, pH, Removal, Waste-Water

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? Bui, T.H., Lindsten, J. and Nordberg, G.F. (1975), Chromosome analysis of lymphocytes from cadmium workers and itai-itai patients. *Environmental Research*, **9** (2), 187-195.

? Kagamimori, S., Okada, A., Sato, T., Kato, T. and Kawano, S. (1978), A plant indicator of air pollution and human health in Japanese rural communities. *Environmental Research*, **17** (1), 33-45.

Abstract: An investigation of the effects of air pollution on vegetation and human health was conducted in a low-degree air-polluted Japanese rural area. The validity of the criteria, which were expressed as Bi-band ratios (R/B, R/G) in leaves of Japanese cedars based on infrared air photography, has been proved worthwhile for estimating the injury to the cedars. The degree of injury to the cedars by field survey showed a significant positive correlation with the concentration of sulfur oxide in the air for the last 3 years. The quantity of water-soluble sulfur in leaves of the cedar was less in the leaves of the less-injured cedars. In school children with positive skin reactions in the area, “subacute cough” (la and/or 3a by BMRC) and “phlegm” (6a and/or 8a by BMRC) had a significant positive correlation with the degree of injury to the cedars.

? Valentine, J.L., Kang, H.K. and Spivey, G.H. (1978), Selenium levels in human blood, urine, and hair in response to exposure via drinking water. *Environmental Research*, **17** (3), 347-355.

Abstract: Blood, hair, urine, and tap water samples were obtained from participants in a population exposed to varying amounts of selenium via water from home wells. Concentrations of selenium in urine and hair produced significant positive correlations with well-water selenium levels. Blood selenium with well-water selenium did not produce a significant correlation. Urine selenium correlation with hair selenium and urine selenium correlation with blood selenium were found to be significant. No significant correlation for hair selenium with blood selenium was found. We conclude that blood selenium alone is not an adequate monitor of selenium exposure or body burden at levels below chronic toxicity.

Brunekreef, B., Veenstra, S.J., Biersteker, K. and Boleij, J.S.M. (1981), The Arnhem lead study. 1. Lead uptake by 1-year-old to 3-year-old children living in the vicinity of a secondary lead smelter in Arnhem, the Netherlands. *Environmental Research*, **25** (2), 441-448.

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Rivera, F., Ramírez, P., Vilaclara, G., Robles, E. and Medina, F. (1983), A survey of pathogenic and free-living amoebae inhabiting swimming pool water in Mexico City. *Environmental Research*, **32** (1), 205-211.

Abstract: A survey of pathogenic and free-living amoebae in swimming pool waters of Mexico City was performed. Among the organisms isolated those which have public health importance were Naegleria fowleri Carter and Acanthamoeba castellanii Douglas. Amoebae of the genera Acanthamoeba, Naegleria, and Vahlkampfia were recovered in their cystic stage while those specimens of the genera Amoeba, Entamoeba, Thecamoeba, and Vanella were recovered only in their trophic stage during this study. Amoebae were concentrated through filtration procedures and subsequently cultured in different culture media. Nonpathogenic amoebae also isolated by culture included: Amoeba proteus (Pallas) Leidy, Amoeba striata Penard, Paratetramitus jugosus Page, Acanthamoeba astronyxis Ray and Hayes, Vahlkampfia avara Page, Vahlkampfia inornata Page, Thecamoeba verrucosa Ehrenberg, and Vanella mira Schaeffer. Trophozoites of Entamoeba gingivalis Gros, were also recovered, both directly and by culture. Most commonly found were amoebae of the species Naegleria gruberi Schardinger (59.02%), N. fowleri (16.77%), and A. castellanii (7.64%). Least-frequently found amoebae belonged to the species Thecamoeba verrucosa (0.12%). All isolated strains of N. fowleri and A. castellanii were thermophilic at 45 and 40°C, respectively, and also pathogenic when inoculated into white mice. More populated by amoebae were those swimming pools of the indoor type with an inner side garden. It was also shown that the free residual chloride values of 0.50 to 1.5 mg/liter, ordinarily used in pool waters, are not adequate for elimination of amoebae.

Clark, C.S., Bornschein, R.L., Succop, P., Que Hee, S.S., Hammond, P.B. and Peace, B. (1985), Condition and type of housing as an indicator of potential environmental lead exposure and pediatric blood lead levels. *Environmental Research*, **38** (1), 46-53.

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Valentine, J.L., Faraji, B. and Kang, H.K. (1988), Human glutathione peroxidase activity in cases of high selenium exposures. *Environmental Research*, **45** (1), 16-27.

Abstract: Four communities with water supplies having selenium concentrations of less than 3.1, 1.7, 189, and 496 micrograms/liter were selected for study. Samples of blood, urine, and tap water were obtained from participants in each community and analyzed for selenium content. Blood samples were also analyzed for glutathione peroxidase activity. Results showed an increase in selenium concentration in the urine as the water selenium increased. Selenium concentrations in blood did not reflect the increased selenium exposure. Glutathione peroxidase activity in whole blood decreased in highly exposed participants compared to those with low exposure. We conclude that, G.L., utathione peroxidase activity in cases of possible environmental toxic exposures will not show the increased activity seen in supplementation of selenium to deficient subjects.

Schwartz, J. and Levin, R. (1991), The risk of lead toxicity in homes with paint hazard. *Environmental Research*, **54** (1), 1-7.

Keywords: Blood, Stature, Boston, Water, Soil

Zuskin, E., Kanceljak, B., Schachter, E.N., Mustajbegovic, J., Goswami, S., Maayani, S., Marom, Z. and Rienzi, N. (1991), Immunological and respiratory findings in swine farmers. *Environmental Research*, **56** (2), 120-130.

Abstract: The prevalence of respiratory symptoms and ventilatory capacity abnormalities in relation to immunological status was studied in 32 swine farmers and in 39 controls. A large number of swine farmers reacted to swine confinement building antigens (swine hair, 34%, swine confinement agents, 28%) but also to other extracts such as animal food (78%) and corn flour (37%). Control workers also reacted to these antigens in similar frequencies. Increased serum IgE levels were found in 3 swine farmers (9.4%) and all 3 had positive skin tests to at least one of the swine antigens. Among control workers one (2.6%) had an increased serum IgE level, this worker exhibited a positive skin reaction to swine food antigen. Swine farmers with positive skin reactions had across-shift reductions of FEF50 and FEF25 significantly larger than those with negative skin tests (P less than 0.01). Preshift measured ventilatory capacity data (FEV1, FEF50, FEF25) in swine farmers with positive skin tests were significantly lower (compared to predicted) than in those with negative skin tests. Additionally, we showed that a water-soluble swine confinement building antigen causes a dose-related contraction of nonsensitized guinea pig trachea smooth muscle studied in vitro. Our data indicate significant differences in lung function between swine workers with positive and negative skin tests. We suggest that skin testing may be helpful in identifying workers at risk for developing lung disease.

Nakamura, H., Katoh, A., Nohara, S., Nakamura, H. and Okada, A. (1992), Experimental studies on the pathogenesis of the gastric mucosal lesions induced by whole-body vibration. *Environmental Research*, **58** (2), 220-229.

Abstract: In order to determine the pathogenesis of gastric mucosal lesions induced by whole-body vibration (WBV), the effects of WBV (3.0 G, 10 Hz, 90 min) on gastric mucosal blood flow (GMBF), plasma corticosterone (COR) and catecholamines (CA), and gastric ulcer formation were investigated in relation to the effects of forced water-immersion stress (FWI) upon the same parameters. While WBV increased GMBF during the exposure, FWI decreased it both during and after the stress. No difference in the severity of ulcer formation between the WBV and the FWI groups was seen. Both WBV and FWI increased plasma COR and CA, although the degree of the increase in COR that accompanied WBV was less than that associated with FWI. Truncal vagotomy attenuated the reduction of GMBF and the extent of ulcer formation that occurred with FWI, but promoted a reduction of GMBF with WBV. These findings indicate that ulceration induced by WBV may be caused primarily by its direct and specific mechanical actions and not by indirect, central nervous system effects known to be important in the pathogenesis of ulcerations produced by mental stress.

Malkin, R., Brandt-Rauf, P., Graziano, J. and Parides, M. (1992), Blood lead levels in incinerator workers. *Environmental Research*, **59** (1), 265-270.

Zuskin, E., Kanceljak, B., Schachter, E.N., Witek, T.J., Maayani, S., Goswami, S., Marom, Z. and Rienzi, N. (1992), Immunological findings in hemp workers. *Environmental Research*, **59** (2), 350-361.

Abstract: Immunological status and its relation to respiratory findings were studied in 42 female textile workers occupationally exposed to hemp dust and in 49 female control workers. Skin prick tests with hemp or flax dust extracts from different parts of the mill in hemp workers demonstrated the following frequencies of positive tests to antigens: a mixture of hemp and flax extracts (64%), followed by flax extracts (48%), hemp from combing machines (41%), hemp from carding machines (38%), hemp from spinning and weaving machines (33%), and hemp from softening machines (20%). The prevalence of positive skin tests to hemp or flax allergens in control workers was consistently lower, ranging from 21 to 5%. Increased total serum IgE was recorded in 35.7% of hemp workers compared to only 5.0% of control workers (P < 0.05). Hemp workers with positive skin tests had significantly higher prevalences of chronic respiratory symptoms than those with negative skin tests. There were, however, no differences for acute symptoms between workers with positive and negative skin tests. Across-shift changes and baseline lung function were not different when compared by immunologic status. We showed additionally that a water-soluble extract of hemp dust causes a dose-related contraction of nonsensitized guinea pig tracheal smooth muscle when studied in vitro. Our results suggest that frequent immunologic abnormalities can be documented in hemp workers but, with the exception of chronic respiratory symptoms, in general, these do not correlate with respiratory findings.

Yokoyama, K. and Araki, S. (1992), Assessment of slow axonal transport in lead-exposed rats. *Environmental Research*, **59** (2), 440-446.

Abstract: To evaluate the effect of lead on slow axonal transport, mean transport velocity (Vmean) of radiolabeled proteins in the motor fibers of the sciatic nerve was calculated by simulating the distribution of radioactivity along the nerve 2 weeks after intraspinal injection of L-[35S] methionine in eight rats given drinking water containing lead acetate for 13 weeks. The transport of individual radiolabeled proteins was also inspected visually by fluorography. It was observed that the Vmean was significantly slowed in the lead-exposed rats and was correlated with blood lead concentration, fluorography indicated that the transport of neurofilament proteins and of tubulins was mildly retarded in the most severely affected lead-exposed rat. These findings suggest that slow axonal transport was impaired by lead. Further study using a large number of animals will be necessary to confirm the findings of the present study.

Peper, M., Klett, M., Frentzel-Beyme, R. and Heller, W.D. (1993), Neuropsychological effects of chronic exposure to environmental dioxins and furans. *Environmental Research*, **60** (1), 124-135.

Full Text: [E\Env Res60, 124.pdf](E/Env%20Res60,%20124.pdf)

Abstract: The environmental contamination by dioxins and furans (PCDD/PCDF) of a local area in southwest Germany due to pyrolytic processes led to a survey of health consequences in the exposed population. 2,3,7,8-TCDD (8000 ng/kg TE (ppt)) was found in the soil and up to 585000 ng/kg TE in attic dust in private homes. In a randomized study group of definitively exposed persons, a neuropsychological test battery was applied and its value as a diagnostic tool investigated. A total group of 19 persons participated in a standard neuropsychological examination including common procedures to evaluate mnestic and attentional performance and psychomotor speed (e.g., WAIS, WMS-R, TMT, and symptom and mood checklists). The range of PCDD/PCDF between 16 and 80 (mean 31) ppt did not vary substantially from blood fat values in a national sample. Results of neuropsychological testing showed only slight deviations from the expected range. Nevertheless, in a high-level exposure group, a reduction of verbal conceptualization, mnestic organization of verbal and visual stimuli, and psychomotor slowing was found. Among other correlations visual exploration speed (TMT) was most directly related to TE. Affective symptoms (such as irritability and emotional instability) were also related to exposure. Results indicate that standard neuropsychological testing can be recommended for the routine evaluation of chronic dioxin exposure.

Keywords: 2,3,7,8-TCDD, Mortality, Workers, Plant

Valentine, J.L., Cebrian, M.E., Garcia-Vargas, G.G., Faraji, B., Kuo, J., Gibb, H.J. and Lachenbruch, P.A. (1994), Daily selenium intake estimates for residents of arsenic-endemic areas. *Environmental Research*, **64** (1), 1-9.

Full Text: [E\Env Res64, 1.pdf](E/Env%20Res64,%201.pdf)

Abstract: The selenium in the diet of persons in arsenic-endemic areas, high levels of arsenic in the drinking water, was evaluated. The methodology used was that of 24-hr dietary recall. Daily selenium intakes of two rural towns in northern Mexico were found to be similar, approximating 72.9 and 60.6 micrograms. These values were similar to those of a previously arsenic-exposed area from California, Edison community. The Edison participants had a daily selenium intake of 61.8 micrograms. The possible negative effect of selenium to produce differences in reported geographical variation in disease could not be substantiated in this study. Other nutrient intakes, protein and energy were also found similar for communities. Differences were noted in vitamin A intake where one-third the daily requirement was experienced by Mexican participants compared to two-thirds the requirement being satisfied by those participants from Edison.

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Full Text: [E\Env Res64, 90.pdf](E/Env%20Res64,%2090.pdf)

Abstract: The assessment of past exposure is a prerequisite to all epidemiological studies on drinking water and cancer. In this study the past exposure assessment of drinking water carcinogenicity was done in terms of the drinking water mutagenicity estimated from historical water parameters and compared with the methods used previously in past exposure assessments in studies on drinking water and cancer. The method was applied in 56 municipalities in Finland. The comparison of different methods in past exposure assessment suggests some advantages for the method presented as it allows a quantitative exposure assessment based on historical information on drinking water mutagenicity. Nevertheless the relevance of the method is with respect to the role of mutagenicity in carcinogenicity and the water type in question.

Koizumi, N., Hatayama, F. and Sumino, K. (1994), Problems in the analysis of cadmium in autopsied tissues. *Environmental Research*, **64** (2), 192-198.

Full Text: [E\Env Res64, 192.pdf](E/Env%20Res64,%20192.pdf)

Abstract: A comparison was made between the concentrations of Cd, Zn, Cu, and Fe in the organs at autopsy and after fixation in formalin for anatomicopathological examination. The concentrations of all the metals were lower in the formalin-fixed organs. In particular, the residual rates of Cd in the renal cortex and medulla were 2.3 and 6.1% of those for the fresh organs, respectively. The Cd concentration in the blood collected at autopsy was several hundred times as high as the value measured before death and failed to be an indicator of exposure to Cd. This phenomenon is specific to Cd and is not found with other metals. In determining Cd in the organs collected at autopsy, it is important to avoid contamination with blood, remove water around the organs quickly, and preserve the organs in sealed polyethylene bags.

Sager, D.B. and Girard, D.M. (1994), Long-term effects on reproductive parameters in female rats after translactational exposure to PCBs. *Environmental Research*, **66** (1), 52-76.

Full Text: [E\Env Res66, 52.pdf](E/Env%20Res66,%2052.pdf)

Abstract: In an integrated series of experiments, we assessed effects of translactational exposure to Aroclor 1254 at three different ages: as young adults (2-4.5 months), as mature adults (5-8 months), and as older adults (8.5-13 months). Developing female rats were exposed postnatally to polychlorinated biphenyls (PCBs) via oral treatment of the dams on Days 1, 3, 5, 7, and 9 of lactation at the following doses: 8 µg/g (PCBI), 32 µg/g (PCBII), and 64 µg/g (PCBIII) in peanut oil. Normal controls (CI) and underfed nutritional controls (CII) received peanut oil. Puberty, both vaginal opening and first estrus, was delayed in PCBII and PCBIII offspring. PCB exposure at all doses had a pronounced and consistent effect on uterine response. In mature PCBII and PCBIII adults, uterine wet weights were reduced at all stages of the estrous cycle and in light-induced persistent vaginal estrus (PVE). PCBI offspring exhibited a decreased uterine weight in proestrus and in light-induced PVE. Exogenous estradiol-17 beta (0.2 µg) given to ovariectomized offspring was less effective in causing a uterotrophic and vaginal response in all PCB-exposed offspring. Analysis of estrous cycles for 40 days at all ages indicated increases in diestrus. Fertility in young adults and mature adults was affected, with PCBIII young adults exhibiting less success with preimplantation stages, and PCBII and PCBIII mature adults showing an effect at pre- and/or postimplantation stages. As determined by patterns in estrous cycling and rate of development of PVE in 64 days of constant light, exposure to PCBs did not hasten reproductive aging at any of the ages examined. Instead, PCBIII young adults and PCBII and PCBIII older adults exhibited a delay in onset of light-induced PVE. This study demonstrates that translactational exposure to a PCB mixture that has little notable effect on the darns, not only delays puberty in the female offspring, but also several months later results in decreased uterine response, impairment of fertility, and irregular cycle patterns. Reproductive aging, however, is not hastened, and even may be delayed. Many of these effects could be explained, in part, by interference with estrogen. (C) 1994 Academic Press, Inc.

Keywords: Polychlorinated Biphenyl Congeners, Hypothalamic Arcuate Nucleus, Aroclor 1254, Polybrominated Biphenyls, Postnatal Exposure, Estrous Cyclicity, Ddt Analogs, Adult Male, Testosterone, Metabolism

Schwartz, J. (1994), Societal benefits of reducing lead exposure. *Environmental Research*, **66** (1), 105-124.

Full Text: [E\Env Res66, 105.pdf](E/Env%20Res66,%20105.pdf)

Abstract: While sophistication in public health research has been increasing substantially in the past few decades, sophistication in decision making about public health and environmental issues has not been increasing in parallel. Measures that are inexpensive tend to be implemented and measures that are expensive tend not to be implemented by makers of public policy. That is often independent of the degree of public health protection afforded by the measures. Understanding and addressing this pattern is crucial to the control of lead exposure of critical populations. People are still exposed to lead in our society not because anyone believes that exposure is good, but because reducing exposure costs money. Maintaining exposure also has its costs, however. It is more difficult to measure them, and they are often ignored in decision making--but they are not small, and attempts to measure them have been made. The high cost of reducing lead exposure of critical populations is the reason that progress in reducing lead-paint exposure has been minimal in the 18 years since the passage of the Lead-Based Paint Poisoning Prevention Act and that it took from the time of the initial proposal in 1973 until 1986 before lead was substantially eliminated from gasoline. In its 1986 rule making, the EPA estimated that the elimination of lead from gasoline would cost more than $500 million per year. Removing leaded paint is estimated to cost billions of dollars. The difference is that the EPA promulgated its rule of removing lead from gasoline, whereas HUD has had little success in removing leaded paint from housing. One reason that the EPA was successful in implementing such an expensive regulation was that it provided detailed estimates of the health and welfare benefits that would accrue and the monetary value of some of the benefits. The EPA cost-benefit analysis demonstrated that the monetary benefits of its regulation far exceeded the costs. That neutralized the cost issue and focused the debate over the regulation on questions of timing. A detailed benefit analysis of reducing lead in drinking water has caused the EPA to consider tighter water lead standards than initially envisioned. Despite years of concern about the consequences of leaded paint poisoning, children continue to be poisoned by leaded paint because it will cost billions of dollars to abate the hazard, and demand for these dollars has lost out to competing needs. (ABSTRACT TRUNCATED AT 400 WORDS).

Frantík, E., Hornychová, M. and Horváth, M. (1994), Relative acute neurotoxicity of solvents: Isoeffective air concentrations of 48 compounds evaluated in rats and mice. *Environmental Research*, **66** (2), 173-185.

Full Text: [E\Env Res66, 173.pdf](E/Env%20Res66,%20173.pdf)

Abstract: Effect-air concentration regressions of 48 common solvents (aromatic, aliphatic, and chlorinated hydrocarbons, alcohols, ketones, acetates) were determined for 4-hr inhalation exposures in male rats and for 2-hr exposures in female mice. Inhibition of propagation and maintenance of the electrically evoked seizure discharge was used as a criterion of the acute neurotropic effect. The isoeffective concentrations in air were estimated by interpolation on the level of one-third of the maximum effect (ECC). ECC estimates ranged from 90 to 24,000 ppm and were several times lower than concentrations evoking behavioral inhibition and by one to two orders lower than concentrations inducing narcosis. Correlations between corresponding values in both species were high (r > 0.9), indicating a relative independence of the estimates from experimental conditions. The relative potency estimates had only negligible correlation with octanol: water distribution coefficients or other physicochemical predictors for the whole sample of solvents, but moderate to high correlation (r = 0.5 to 0.9) in homogenous groups of nonpolar solvents, permitting cautious predictions. When applied to known effective concentrations of some solvents on human performance and subjective state, the comparative potency procedure suggests that ceiling and STEL values of some solvents may not reliably protect workers from acute nervous depression.

Berny, P.J., Côté, L.M. and Buck, W.B. (1994), Relationship between soil lead, dust lead, and blood lead concentrations in pets and their owners: Evaluation of soil lead threshold values. *Environmental Research*, **67** (1), 84-97.

Full Text: [E\Env Res67, 84.pdf](E/Env%20Res67,%2084.pdf)

Abstract: This paper reports the results of a study conducted in Granite City, Illinois during the months of August through October 1991. The study involved a subpopulation of 77 households having 106 dogs and cats which was a corollary to a major study conducted in humans by the Illinois Department of Public Health to evaluate lead exposure. A secondary lead smelter had been in operation in this town for almost 80 years and was shut down in 1982. Important soil contamination with lead was reported and this paper presents data regarding levels of soil and dust lead and associated blood lead concentrations in animals and their owners in a total of 77 households. Overall, blood lead concentrations (BLC) were low (0-13 micrograms/dl in the animal owners, 0-28 micrograms/dl in pets). There was no significant relationship between soil or dust lead and BLC in humans, however, the relationship was significant in animals. Odds ratios were computed to determine whether 500 or 1000 ppm lead in environmental samples was associated with increased risk of having a high BLC. We could not find any increased risk in humans, while the risk did increase in animals. It is concluded that animals are more at risk than their owners of having a high BLC when exposed to the same contaminated environment and can be used to monitor the bioavailability of lead.

Lantz, R.C., Parliman, G., Chen, G.J. and Carter, D.E. (1994), Effect of arsenic exposure on alveolar macrophage function. I. Effect of soluble As(III) and As(V). *Environmental Research*, **67** (2), 183-195.

Full Text: [E\Env Res67, 183.pdf](E/Env%20Res67,%20183.pdf)

Abstract: Despite potential differences in the mechanism and potency of toxicity between the two common oxidation states of arsenic (As(III) and As(V)), assessments of the risk from inhaled arsenic generally ignore the oxidation state of inorganic arsenicals. Differences between potency and toxicity of As(III) and As(V) were evaluated by determining alteration in function of pulmonary alveolar macrophages (PAM) following in vivo and in vitro exposure to soluble arsenic. Male Sprague-Dawley rats were used throughout. One day following intratracheal instillation of 1 mg/ml (as arsenic) of either sodium arsenite (As(III)) or sodium arsenate (As(V)), PAM were lavaged and analyzed for alterations in superoxide (O2-), prostaglandin E(2) (PGE(2)), and tumor necrosis factor (TNF-alpha) production. There were no differences in bronchoalveolar lavage fluid PGE(2) or TNF-alpha. PAM lavaged from As(V)exposed animals showed significant increases in O2- production. In vivo exposure to either oxidative form of arsenic decreased basal and lipopolysaccharide (LPS)-induced release of TNF-alpha production by PAM, but did not suppress LPS-induced production of PGE(2). To test the direct effects of arsenic on PAM function, PAM were lavaged from control animals and exposed, in vitro, to either arsenical for up to 24 hr to concentrations of 0.1 to 300 µg/ml arsenic. Doses used were not cytotoxic to PAM, since LDH release was not significantly increased, even at the highest dose. Significant dose-dependent inhibition of O2- production was only evident after 24 hr exposure to arsenicals. As(III) was more potent than As(V), inhibiting O2- at concentrations as low as 0.1 µg/ml compared to 1.0 µg/ml of As(V). Suppression of LPS-induced release of TNF-alpha also occurred at lower concentrations of As(III), 50% inhibition at 0.15 µg/ml, compared to As(V), 50% inhibition at 1.8 µg/ml. While As(II) exposure had no affect on PGE(2) production, As(V) caused inhibition of LPS-induced PGE(2) production at concentrations above 1.0 µg/ml. Differences between As(III) and As(V) indicate that different mechanisms and/or potencies exist between the two arsenic species. Arsenic-induced alteration in PAM function may compromise host defense against infections and alter immune surveillance. (C) 1994 Academic Press, Inc.

Keywords: Tumor-Necrosis-Factor, NF-KAPPA-B, Bacterial Lipopolysaccharide, Metallic-Ions, Toxicity, Defense, Transcription, Superoxide, Lung

Cuijpers, C.E.J., Swaen, G.M.H., Wesseling, G., Sturmans, F., Wouters, E.F.M. (1995), Adverse-effects of the indoor environment on respiratory health in primary-school children. *Environmental Research*, **68** (1), 11-23.

Full Text: [E\Env Res68, 11.pdf](E/Env%20Res68,%2011.pdf)

Abstract: Exposure to various factors from the indoor environment on respiratory health of 470 Dutch primary school children was studied. We investigated which of the factors, such as home dampness, passive smoking, unvented kitchen geysers, or pets, affected children’s respiratory health the most, and whether airway sensitivity to these indoors exposures differed between boys and girls. Information on respiratory morbidity and characteristics of the housing was obtained by a written questionnaire, completed by the parents of the children. Lung function of the children was measured at school, by forced oscillation technique (FOT) and spirometry. In boys, all investigated lung function parameters were significantly affected by exposure to passive smoking during the child’s entire life. Although mostly nonsignificant, all of the reported asthma-like symptoms were related especially to maternal smoking, with a trend of a dose-response relationship. Furthermore, damp stains (P < 0.05) and mold growth (ns) were associated with chronic cough and with small but significant impairments in part of the lung function parameters. No consistent patterns were observed with unvented kitchen geysers and pets. Although passive smoking (cumulative dose) in girls was also associated with lung function impairments, the effects were smaller than those in boys and not all significant. Associations between the asthma-like symptoms and the dose of maternal and paternal smoking also were less consistent. Furthermore, no associations were found with the dampness indicators and with pets, but unvented kitchen geysers were significantly related to impairments in some of the impedance indices. This study shows detrimental effects of several indoor factors on the prevalence of chronic respiratory symptoms and lung function in children, which are most pronounced for passive smoking, and somewhat less pronounced for dampness and the presence of unvented kitchen geysers. Airway sensitivity to these exposures appeared to be higher in boys than in girls. (C) 1995 Academic Press, Inc.

Keywords: Forced Oscillation Technique, Passive Smoking, Home Dampness, Pulmonary-Function, Childhood Asthma, Nitrogen-Dioxide, Lung-Function, Risk-Factors, Symptoms, Resistance

Lantz, R.C., Parliman, G., Chen, G.J., Barber, D., Winski, S. and Carter, D.E. (1995), Effect of arsenic exposure on alveolar macrophage function. II. Effect of slightly soluble forms of As(III) and As(V). *Environmental Research*, **68** (1), 59-67.

Full Text: [E\Env Res68, 59.pdf](E/Env%20Res68,%2059.pdf)

Abstract: The pulmonary toxicity of a substance depends on a number of chemical and physical characteristics, including the solubility of the compounds. In the lung, insoluble forms of metals may be more tumorigenic than soluble forms despite the fact that this effect has not been quantitated and the mechanism of action has not been elucidated. The toxic effects of slightly soluble forms of As(III) and As(V) were evaluated by determining alteration in function of pulmonary alveolar macrophages (PAM) following in vivo and in vitro exposure. Male Sprague-Dawley rats were used throughout. Twenty-four hours following intratracheal instillation of 1 mg/kg (as arsenic) of either arsenic trisulfide (As(III)) or calcium arsenate (As(V)), PAM were lavaged and analyzed for alterations in superoxide (O2-), and tumor necrosis factor (TNF-alpha) production. There were no differences in bronchoalveolar lavage fluid TNF-alpha. PAM. lavaged from As(V)-exposed animals showed significant increases in O2- production and in basal release of TNF-alpha. PAM lavaged from animals receiving As(III) did not show significant alterations. To test the direct effects of arsenic, PAM were lavaged from control animals and exposed to concentrations of 0, 1 to 300 µg/ml arsenic in vitro for up to 24 hr. Doses used were not cytotoxic to PAM, since LDH release was not significantly increased. Significant dose-dependent inhibition of O2- production was only evident after 24 hr exposure to arsenicals. Both As(III) and As(V) produced inhibition at concentrations of 10 µg/ml. Suppression of LPS-induced release of TNF-alpha also occurred at similar concentrations for both arsenicals (4-5 µg/ml). Neither arsenical inhibited prostaglandin E(2) production. Measurement of soluble arsenic concentrations indicated dissolution of the compounds could not account for all of the effects seen. Arsenic-induced alteration in PAM function may compromise host defense. (C) 1995 Academic Press, Inc.

Keywords: Metallic-Ions, Toxicity, Release, Lung, Inhalation, Trioxide, Invitro, Defense, Cells, Lead

Wolf, N. and Karmaus, W. (1995), Effects of inhalative exposure to dioxins in wood preservatives on cell-mediated-immunity in day-care-center teachers. *Environmental Research*, **68** (2), 96-105.

Full Text: [E\Env Res68, 96.pdf](E/Env%20Res68,%2096.pdf)

Abstract: The study investigated the effects of chronic inhalative low-level exposure to dioxins in day-care centers containing wood treated with preservatives on (1) the number of peripheral CD4 and CDS cells and the CD4: CD8 ratio in peripheral blood and (2) the delayed-type hypersensitivity reaction of the skin (Multitest Merieux). The study population consisted of 221 exposed and 189 unexposed employees of day-care centers in or near Hamburg. A status of decreased skin test reagibility was operationalized as hypoergy I (score <5 mm), hypoergy II (less than or equal to 1 positive reaction), and anergy (no positive reaction). Taking the fading during postexposure time into account, a surrogate for the dioxin burden based on the concentration of dioxins in indoor air (measured using the 2,3,7,8-TCDD TEF followed by the Federal Republic of Germany) was modeled. No effect was found regarding the number of CD4 cells, CD8 cells, and CD4: CD8 ratio. However, some evidence for an increasing dose-response relationship between inhalative exposure to dioxins and the risk of hypoergy and anergy was found, both in the total study population and among subjects with a short postexposure time (less than or equal to 6 months). Subjects with a short postexposure time and a dioxin burden >0.6 pg/m(3) had a significantly higher risk of hypoergy than unexposed subjects (hypoergy I: OR = 9.51, 95% CI = 1.9-42.02, hypoergy II: OR = 2.92, 95% CI = 1.14-7.5). It is concluded that a suppressive effect of inhalative exposure to dioxins in wood preservatives on human cell-mediated immunity cannot be ruled out. (C) 1995 Academic Press, Inc.

Keywords: Long-Term Exposure, Health, 2,3,7,8-Tetrachlorodibenzo-Para-Dioxin

Hewitt, D.J., Millner, G.C., Nye, A.C. and Simmons, H.F. (1995), Investigation of arsenic exposure from soil at a superfund site. *Environmental Research*, **68** (2), 73-81.

Full Text: [E\Env Res68, 73.pdf](E/Env%20Res68,%2073.pdf)

Abstract: The purpose of this study was to determine if significant arsenic exposure was occurring at a Superfund site with elevated surface soil arsenic concentrations. A second objective was to determine the statistical relationship between the various methods of measuring arsenic exposure in humans. Random urine, 24-hr urine, hair, and fingernail samples were collected at the end of the workweek from 40 employees at an active pesticide manufacturing facility which had formerly produced arsenical pesticides. There was no indication of adverse health effects among the employees attributable to arsenic exposure. Mean urinary, hair, and fingernail concentrations of arsenic were well within normal values and indicated that significant arsenic exposure was not occurring among the employees. Random and 24-hr urine measurements were significantly correlated. Hair and fingernail results also were significantly correlated. Urine results did not correlate well with hair or fingernail results. Results of this study suggest that although there may be some individual variation, random and 24-hr urine arsenic results are not substantially different. For the purposes of screening for arsenic exposure, random urine samples may be an adequate and preferable test for those populations in equilibrium with their environment. (C) 1995 Academic Press, Inc.

Keywords: Speciation, Cancers

Holladay, S.D. and Smith, B.J. (1995), Alterations in murine fetal thymus and liver hematopoietic-cell populations following developmental exposure to 7, 12-dimethylbenz[a]anthracene. *Environmental Research*, **68** (2), 106-113.

Full Text: [E\Env Res68, 106.pdf](E/Env%20Res68,%20106.pdf)

Abstract: Gestational exposure of ICR mice to the environmental contaminant 7, 12-dimethylbenz[a]anthracene (DMBA) was used (i) to study the developmental immunotoxicity of this chemical agent and (II) to evaluate potential hematopoietic cellular targets in a sensitive developmental model which may be involved in immunosuppression induced by this carcinogenic polycyclic aromatic hydrocarbon (PAH). DMBA produced a dose-dependent hypocellularity in both fetal mouse thymus and liver. Resident hematopoietic cell subpopulations in fetal liver, identified by CD44, CD45R, and Mac-1 monoclonal antibody binding, were reduced by the gestational DMBA treatment. In particular, the total number of CD45R(+) B-lineage lymphocytic cells in fetal liver was reduced to 20% of control levels by DMBA. Unlike previous reports with related PAH, DMBA did not inhibit thymocyte differentiation, as indicated by unaltered thymocyte expression of CD4, CD8, and heat-stable antigens. These data may indicate that production of thymic atrophy and impairment of thymocyte differentiation by PAH involve separate mechanisms of action. Results of the present study additionally identify changes in immune cell populations that correlate well with inhibition of cell- and humoral-mediated immunity in experimental animals treated with DMBA. (C) 1995 Academic Press, Inc.

Keywords: Polycyclic Aromatic-Hydrocarbons, Dioxin Tcdd, Ah Receptor, Coal-Tar, Mouse, Mice, Skin, Immunosuppression, Benzo<A>Pyrene, Mechanisms

Zuskin, E., Mustajbegovic, J., Schachter, E.N., Kern, J., Rienzi, N., Goswami, S., Marom, Z. and Maayani, S. (1995), Respiratory function in poultry workers and pharmacologic characterization of poultry dust extract. *Environmental Research*, **70** (1), 11-19.

Full Text: [E\Env Res70, 11.pdf](E/Env%20Res70,%2011.pdf)

Abstract: A group of 343 workers (252 males and 91 females) employed in four poultry farms in Croatia was studied for the prevalence of acute and chronic respiratory symptoms and lung function changes. There were significantly higher prevalences of chronic cough, chronic phlegm, chronic bronchitis, and chest tightness in poultry workers than in control workers. Male poultry workers who were smokers had significantly higher prevalences of chronic cough, chronic phlegm, and chronic bronchitis than poultry workers who were nonsmokers (P<0.01). Poultry workers exposed for more than 10 years had significantly higher symptoms prevalences than those workers with shorter exposures (except among female smokers). There was also a high prevalence in poultry workers of acute symptoms which developed during the work shift. The measured FVC, FEV1, and FEF25 in poultry workers were significantly lower than predicted normal values. Workers exposed for more than 10 years had lower ventilatory capacity tests (expressed as percentage of predicted) than those workers with shorter exposures. Changes in FEV1, FEF50, and FEF25 were less pronounced than FVC. Additionally we showed that a water-soluble poultry dust extract obtained from this workplace caused a dose-related contraction of nonsensitized guinea pig tracheal smooth muscle when studied in vitro. Pharmacologic studies of this response indicate that it may result from the release of multiple endogenous mediators. Our data suggest that work in poultry farms may, for some workers, cause the development of acute and chronic respiratory symptoms and lung function changes.

Malkin, R. (1995), Occupational and environmental lead and PCB exposure at a scrap metal dealer. *Environmental Research*, **70** (1), 20-23.

Full Text: [E\Env Res70, 20.pdf](E/Env%20Res70,%2020.pdf)

Abstract: Blood lead levels (BPb) and serum polychlorinated biphenyl levels (PCB) were obtained from 17 employees at two adjacent scrap metal dealers. One facility was located outdoors, directly on top of soil known to be contaminated with lead and PCBs, and the other was located indoors with a concrete floor. BPbs ranged from 4.0 to 39.8 µg/dl (mean 19.9 µg/dl, geometric mean 17.5 µg/dl) and PCB levels ranged from < 1 to 65.3 ppb (mean 7.5 ppb). There was no significant difference in either BPb or serum PCB between the two sites. BPb was significantly correlated with the number of cigarettes smoked at work, and both BPb and serum PCB were significantly related to eating lunch outside the lunchroom, suggesting hand-to-mouth contact as a source of exposure. The lack of difference in BPb between employees of the two scrap metal dealers suggests an ongoing source of lead exposure at the sites, other than the soil.

Keywords: Polychlorinated-Biphenyls

Grandjean, P., Weihe, P., Needham, L.L., Burse, V.W., Patterson, D.G., Sampson, E.J., Jorgensen, P.J. and Vahter, M. (1995), Relation of a seafood diet to mercury, selenium, arsenic, and polychlorinated biphenyl and other organochlorine concentrations in human milk. *Environmental Research*, **71** (1), 29-38.

Full Text: [E\Env Res71, 29.pdf](E/Env%20Res71,%2029.pdf)

Abstract: Human transition milk was sampled from 88 mothers at the Faroe Islands, where the seafood diet includes pilot whale meat and blubber. Milk mercury concentrations (median, 2.45 µg/liter) were significantly associated with mercury concentrations in cord blood and with the frequency of pilot whale dinners during pregnancy, Milk selenium concentrations (mean, 19.1 µg/liter) correlated significantly with concentrations in cord blood but not with seafood consumption. Arsenic concentrations were very low. Twenty-four of the milk samples were separated into four pools based on fish intake and milk mercury concentrations. The polychlorinated biphenyl (PCB) concentrations (1.8-3.5 µg/g lipid) were high and mainly due to congener numbers 153, 180, and 138. One pool contained a congener 77 concentration of 1380 ppt, which is the highest ever reported in a human specimen for a coplanar PCB. The highest PCB concentrations were seen in the pools from women who had eaten frequent whale dinners and whose milk contained high mercury concentrations, The concentrations of chlorinated dibenzo-p-dioxins and furans were not similarly elevated. Given the advantages associated with breast-feeding, advice to nursing mothers in this population should take into regard the possible risks associated with long-term exposure to milk contaminants. (C) 1995 Academic Press, Inc.

Keywords: Trace-Elements, Coplanar PCBS, Breast-Milk, Methylmercury, Infants, Exposure, Consumption, Serum, Mothers, Finland

Moon, C.S., Zhang, Z.W., Shimbo, S., Watanabe, T., Moon, D.H., Lee, C.U., Lee, B.K., Ahn, K.D., Lee, S.H. and Ikeda, M. (1995), Dietary intake of cadmium and lead among the general population in Korea. *Environmental Research*, **71** (1), 46-54.

Full Text: [E\Env Res71, 46.pdf](E/Env%20Res71,%2046.pdf)

Abstract: This survey was conducted in Seoul, Pusan, Chunan, and Haman in Korea to clarify cadmium and lead burden in the general Korean populations in terms of dietary intake of cadmium and lead and the concentrations of the two metals in blood. People who participated in the study were 141 healthy nonsmoking women aged 21-56 years. Determination of cadmium and lead in 24-hr food duplicates and blood samples was carried out by graphite furnace atomic absorption spectrophotometry. The geometric means for the four sites in combination were 21.2 µg/day for dietary cadmium, 20.5 µg/day for dietary lead, 1.27 ng/ml for blood cadmium, and 44.3 ng/ml for blood lead. Cadmium intake from boiled rice accounted for 23% of total daily cadmium intake. The counterpart value for lead intake from boiled rice was 12%. Blood cadmium levels and dietary cadmium intake were lower and blood lead level and dietary lead intake were higher in Korean women than in Japanese women. The values for dietary cadmium are similar to, and the values for dietary lead are somewhat lower than, the levels reported from Europe and the United States. Dietary intake was the main source of cadmium exposure, whereas lead exposure was from both ambient air and foods in the Korean population. (C) 1995 Academic Press, Inc.

Keywords: Chemical Contaminants, Nonpolluted Areas, Japanese Farmers, Blood, Exposure, Foods, Inhabitants, Elements, Metals, Rice

Hwang, Y.H., Bornschein, R.L., Grote, J., Menrath, W. and Roda, S. (1997), Environmental arsenic exposure of children around a former copper smelter site. *Environmental Research*, **72** (1), 72-81.

Full Text: [E\Env Res72, 72.pdf](E/Env%20Res72,%2072.pdf)

Abstract: Arsenic residues in the communities surrounding former smelters remain a public health concern, especially for infants and children, To evaluate environmental exposure among these children, a population-based cross-sectional study was conducted in the vicinity of a former copper smelter in Anaconda, Montana A total of 414 children less than 72 months old were recruited, First morning voided urine samples and environmental samples were collected for arsenic measurements. The geometric mean of speciated urinary arsenic was 8.6 µg/liter (GSD = 1.7, N = 289). Average arsenic levels of different types of soil ranged from 121 to 236 µg/g, and were significantly related to proximity and wind direction to the smelter site. The same significant relationship was observed for interior dust arsenic, Speciated urinary arsenic was found to be significantly related to soil arsenic in bare areas in residential yards (P < 0.0005). In general, elevated excretion of arsenic was demonstrable and warranted parents’ attention to reduce exposure of their children to environmental arsenic. (C) 1997 Academic Press.

Keywords: Estimating Soil Ingestion, Young-Children, Water, Metabolites, Absorption, Mortality

Emond, M.J., Lanphear, B.P., Watts, A., Eberly, S., Weitzman, M., Clarkson, T., Winter, N.L., Aptez, L., Yakir, B., Galke, W., Jacobs, D., Matte, T., Clark, S., Farfel, M., Graef, J., Schwartz, J. and Silbergeld, E. (1997), Measurement error and its impact on the estimated relationship between dust lead and children’s blood lead. *Environmental Research*, **72** (1), 82-92.

Full Text: [E\Env Res72, 82.pdf](E/Env%20Res72,%2082.pdf)

Abstract: Objective. Lead-contaminated house dust is a major contributor to lead intake among urban children, but the reliabilities of various dust lead measurement methods and their impact on the estimated correlations between dust lead and children’s blood lead levels are unknown, Methods. Repeated field measurements of lead-contaminated dust from children’s homes were taken from 16 housing units using five dust lead measurement methods, Estimates of measurement error were used to obtain reliability ratios for the dust lead measurements, which were then used to correct estimated correlations between lead-contaminated dust and children’s blood lead, Results, Reliability varied over methods and surface types (from 0.0 to 0.8), but wipe loading and the BRM vacuum loading methods generally had greater reliability, Technician effects, inadvertent field exposure to lead, contamination of collection equipment, and laboratory instrument error were found to contribute little to total measurement error, Corrected correlations between blood lead and wipe loading measurements were 7 to 104% higher than uncorrected correlations, The multiple R(2) and partial R(2) for a wipe composite measurement in a multivariate regression model increased from 0.43 to 0.64 and from 0.053 to 0.26, respectively, after correction for measurement error bias, Conclusions, Variation in lead deposition within small areas and variations in collection inherent to the devices are major contributors to measurement error, Measurement error causes dramatic underestimation of correlation between lead-contaminated house dust and children’s blood lead. (C) 1997 Academic Press.

Trepka, M.J., Heinrich, J., Krause, C., Schulz, C., Lippold, U., Meyer, E. and Wichmann, H.E. (1997), The internal burden of lead among children in a smelter town: A small area analysis. *Environmental Research*, **72** (2), 118-130.

Full Text: [E\Env Res72, 118.pdf](E/Env%20Res72,%20118.pdf)

Abstract: Hettstedt, a city in former East Germany with a history of mining and smelting of nonferrous ores, has multiple lead waste deposits and the remains of a former lead and copper-silver smelter. A small-area analysis of lead concentrations in blood and in household dust was undertaken in a cross-sectional study to determine if children living near the sources had particularly high burdens of lead. The overall geometric mean of the region was 38.0 μg Pb/liter blood with a 95% confidence interval (CI) of 36.5-39.5. The burden of lead among children living in the region containing the lead tailings piles and adjacent smelters was almost twice as high (77.4 μg Pb/liter blood, 95% CI 65.0-92.0). It decreased in the areas farther northeast from the smelter. Lead levels in the children residing in areas southwest of the smelters were not appreciably elevated. The same pattern was found in house dust lead concentrations. This analysis helped target areas where follow-up is needed and found that not only distance from lead sources, but also meteorological factors played an important role in lead exposure. (C) 1997 Academic Press.

Keywords: Blood Lead, Environmental

Rust, S.W., Burgoon, D.A., Lanphear, B.P. and Eberly, S. (1997), Log-additive versus log-linear analysis of lead-contaminated house dust and children’s blood-lead levels: Implications for residential dust-lead standards. *Environmental Research*, **72** (2), 173-184.

Full Text: [E\Env Res72, 173.pdf](E/Env%20Res72,%20173.pdf)

Abstract: The Environmental Protection Agency has been mandated to develop a health-based standard for lead in residential dwellings in the United States. Prior estimates of the relationship between residential dust-lead levels and children’s blood-lead concentrations have usually been obtained by using a log-linear regression of blood-lead concentration on levels of lead-contaminated house dust. It remains unknown, however, whether the log-linear model or a frequently cited alternative, the log-additive model, is the preferable regression method for analyzing these data. Secondary analysis of the Lead-in-Dust Study data was undertaken to compare log-additive with log-linear regression analysis for the purpose of developing a health-based dust lead standard. Specifically, we were interested in comparing the log-additive and log-linear analyses in their ability to characterize adequately the relationship of dust-lead loading on various surfaces with blood-lead concentrations among urban children and to develop a predictive model to estimate the risk that a child will develop an elevated blood-lead level on the basis of a known level of dust lead. We used two dust sampling methods, the Baltimore Repair and Maintenance (BRM) vacuum method and the wipe method, to compare the loglinear and log-additive models. The log-linear model was consistently superior to the log-additive model in its ability to explain the variability in the observed blood-lead concentrations of the studied children, for both the wipe sampler and the BRM sampler. In addition, the log-additive model often predicted only a limited increase in the probability of blood-lead concentrations exceeding 10 µg/dl as a result of doubling the dust-lead loading exposure, whereas the log-linear model consistently demonstrated a significant increase in the probability of blood-lead concentrations exceeding 10 µg/dl. BRM lead loading explained additional variability in blood lead above and beyond that explained by wipe loading for both carpeted and uncarpeted floors. In contrast, wipe-lead loading explained significant additional variability after adjustment for BRM loading for both uncarpeted floors and interior window sills. Although BRM loading better predicted children’s blood-lead concentrations than did wipe loading, these differences were not statistically significant. We conclude that the log-linear model explained a greater percentage of the variability in blood-lead concentrations than did the log-additive model, indicating that the log-linear model should be the default model of choice for developing a dust-lead standard. (C) 1997 Academic Press.

Keywords: Environmental Lead, Exposure

Hoppin, J.A., Elreedy, S. and Ryan, P.B. (1997), Validation of a self-administered lead exposure questionnaire among suburban teenagers. *Environmental Research*, **74** (1), 1-10.

Full Text: [E\Env Res74, 1.pdf](E/Env%20Res74,%201.pdf)

Abstract: Teenagers represent a unique population in which to evaluate lead exposure. A self-administered questionnaire was developed to evaluate the current and historic lead exposures of teenagers. This work evaluates the exposure questionnaire for both its ability to predict lead exposure and the accuracy of the teenage respondents. Subjects received the survey at school and were instructed to get assistance from their parents in questionnaire completion. Environmental samples (dust, soil, and water) were collected from 30 suburban Boston homes to evaluate the questionnaire’s predictiveness. To evaluate the accuracy of subjects’ responses, independent information about housing was obtained. The questionnaire was effective in identifying predictors of dust and soil lead levels, but not for water lead levels. Fine dust lead loading (< 150 microns) varied significantly among the six housing age categories (pre-1940, 1940-1949, 1950-1959, 1960-1969, 1970-1979, and > 1979) and traffic levels. Fine dust lead concentrations varied significantly with decade of housing construction. Mean soil lead levels varied significantly among housing age categories, traffic levels, and exterior construction materials. For the important predictors, there was excellent agreement between the teenagers’ self-report and confirmatory information. For housing age categories, the observed agreement was 69%, for traffic level, the observed agreement was 88%. These results illustrate that questionnaires continue to be useful in evaluating home lead levels even in suburban homes and that teenagers are accurate respondents.

Ostro, B. and Chestnut, L. (1998), Assessing the health benefits of reducing particulate matter air pollution in the United States. *Environmental Research*, **76** (2), 94-106.

Full Text: [E\Env Res76, 94.pdf](E/Env%20Res76,%2094.pdf)

Abstract: Most Americans are exposed daily to airborne particulate matter (PM), a pollutant regulated by the U.S. Environmental Protection Agency, Current national standards are set for PM10 (particles less than 10 µm in diameter) and new standards have been promulgated for PM2.5 (particles less than 2.5 µm in diameter), Both particle sizes have been associated with mortality and morbidity in studies in the United States and elsewhere and an unambiguously safe level of ambient PM has been difficult to identify, PM10 concentrations have been reduced significantly in U.S. cities over the past two decades and relatively few locations continue to exceed national PM10 standards, However, the new PM2.5 standards will require further reductions in PM concentrations and additional expenditures for emission controls, Information about the health and economic benefits of achieving lower PM concentrations is important because: (1) expected costs of further PM reductions rise after the least-cost options are exhausted, and (2) there is uncertainty about the existence of a threshold safe level for PM, This paper develops and applies a methodology for quantifying the health benefits of potential reductions in ambient PM, Although uncertainties exist about several components of the methodology, the results indicate that the annual nationwide health benefits of achieving the new standards for PM2.5 relative to 1994-1996 ambient concentrations are likely to be between $14 billion and $55 billion annually, with a mean estimate of $32 billion. (C) 1998 Academic Press.

Keywords: Respiratory Hospital Admissions, Emergency Room Visits, Daily Mortality, Acid Aerosols, Morbidity, Children, Cost, Associations, Detroit, Ontario

Ding, Y., Vaziri, N.D. and Gonick, H.C. (1998), Lead-induced hypertension-II. Response to sequential infusions of L-arginine, superoxide dismutase, and nitroprusside. *Environmental Research*, **76** (2), 107-113.

Full Text: [E\Env Res76, 107.pdf](E/Env%20Res76,%20107.pdf)

Abstract: Administration of 100 ppm lead acetate daily for 3 months caused hypertension in Sprague-Dawley rats, with reversal by treatment with 2,3-dimercaptosuccinic acid (DMSA) (0.5% for 2 weeks). Animals from each group were infused sequentially in 30-min intervals with saline (S), L-arginine (Arg), Arg + superoxide dismutase (SOD), S, and sodium nitroprusside (SNP). Baseline mean blood pressure (MBP) was elevated in lead-treated animals (Pb) compared to that in controls(C), returning toward normal after DMSA (105±2 mmHg, C, vs 149±2, Pb, and 124±1, DMSA, P<0.001). Infusion of Arg caused a fall in MBP in all animals, normalizing the MBP in Pb-treated animals. SNP caused a greater fall in MBP in all groups of animals, normalizing the MBP in Pb. Measurement of urinary nitrite + nitrate (NOx) by chemiluminescence revealed at baseline a reduced level in Pb, restored to normal by DMSA (6.6±1.5 nmol/min/100 g BW, C, vs 3.3±1.7, Pb, P<0.05, vs 5.8±2.6, DMSA, P = NS). Infusion of arginine increased urinary NOx in all groups, but to a lesser degree in Ph and DMSA. Assay of plasma malondialdehyde (MDA) by HPLC, as a measure of reactive oxygen species (ROS), was elevated at baseline in Pb, reduced by DMSA (3.6±0.4 µmol/L, Pb, vs 1.9±0.2, C, and 1.9±0.3, DMSA, P<0.01). In the Pb group, SOD resulted in a significant fall in MDA (2.0±0.3 µmol/L, SOD, vs 3.1±0.1, Arg, P<0.01), but no further fall in MBP or increase in urinary NOx. Thus, hypertension in lead-exposed animals is related to both diminished NO and increased ROS. The elevation in MBP can be ameliorated by additional NO through infusion of substrate arginine or by treatment with the ROS scavenger, DMSA. Lead-exposed animals show enhanced MBP sensitivity to the NO donors, Arg and SNP, but no further response to SOD, despite a reduction in MDA to normal. We speculate that lead-induced hypertension may be caused by one species of ROS which enhances vascular reactivity, and that provision of additional NO acts to scavenge the ROS and/or acts directly as a vasodilator. (C) 1998 Academic Press.

Keywords: Hypertension, Reactive Oxygen Species, Meso-2,3-Dimercaptosuccinic Acid, Superoxide Dismutase, Lead, Nitric-Oxide, Blood-Pressure, Free-Radicals, Endothelium, Acid, Nitrate, Release, Damage, Rats

Wyatt, C.J., Fimbres, C., Romo, L., Méndez, R.O. and Grijalva, M. (1998), Incidence of heavy metal contamination in water supplies in Northern Mexico. *Environmental Research*, **76** (2), 114-119.

Full Text: [E\Env Res76, 114.pdf](E/Env%20Res76,%20114.pdf)

Abstract: Contaminants in drinking water present public health risks. The objective of this study was to analyze water samples taken from wells or storage tanks, direct sources for domestic water in Northern Mexico, for the presence of lead (Pb), copper (Cu), cadmium (Cd), arsenic (As), and mercury (Hg). The samples were analyzed by atomic absorption coupled with a hydride generator or a graphite furnace. High levels of Pb (0.05-0.12 ppm) were found in Hermosillo, Guaymas, and Nacozari. Forty-three percent of the samples in Sonora exceeded the action level (0.015 ppm) established by the EPA for Pb. For As, 8.92% exceeded the limit with a range of 0.002-0.305 ppm. Several studies have indicated a possible link between As and fluoride (F) in drinking water. This study showed a positive correlation between F and As (r = 0.53, P = 0.01, and n = 116). One location in Hermosillo had 7.36 ppm of F and 0.117 ppm of As, 3.5 times the recommended F levels in drinking water and 2 times higher than the level permitted for As. Hg contamination was found in 42% of the samples. Based on the results of this study, it appears that As, Hg, and Pb contamination in the drinking water for some areas of the state of Sonora is a major concern.

Keywords: Heavy Metals, Drinking Water, Northern Mexico, Lead, Arsenic

Lanphear, B.P., Burgoon, D.A., Rust, S.W., Eberly, S. and Galke, W. (1998), Environmental exposures to lead and urban children’s blood lead levels. *Environmental Research*, **76** (2), 120-130.

Full Text: [E\Env Res76, 120.pdf](E/Env%20Res76,%20120.pdf)

Abstract: Lead-contaminated water, soil, and paint have been recognized as potential sources of children’s lead exposure for decades, but their contributions to lead intake among urban children remain poorly defined. This analysis was undertaken to estimate the relationship of environmental lead exposures to lead intake among a random sample of urban children, adjusted for exposure to lead-contaminated house dust. Analyses of 183 urban children enrolled in a random sample, cross sectional study were conducted. Children’s blood and multiple measures of household dust, water, soil, and paint were analyzed for lead, and interviews were conducted to ascertain risk factors for childhood lead exposure. Environmental sources of lead, including house-dust, soil lead, and water lead, were independently associated with children’s blood lead levels. In contrast, paint lead levels did not have a significant effect on blood lead levels after adjusting for other environmental exposures. An increase in water lead concentration from background levels to 0.015 mg/L, the current EPA water lead standard, was associated with an increase of 13.7% in the percentage of children estimated to have a blood lead concentration exceeding 10 µg/dL, increasing soil lead concentration from background to 400 µg/g was estimated to produce an increase of 11.6% in the percentage of children estimated to have a blood lead level exceeding 10 µg/dL, and increasing dust lead loading from background to 200 µg/ft2 is estimated to produce an increase of 23.3% in the percentage of children estimated to have a blood lead level exceeding 10 µg/dL. These data support the promulgation of health-based standards for lead-contaminated dust and soil and the progressive lowering of standards for lead-contaminated water as the definition of undue lead exposure has been modified. (C) 1998 Academic Press.

Keywords: Blood Lead, Lead-Contaminated House Dust, Children, Environmental Exposure, Lead-Contaminated Soil, Lead-Based Paint, Water, Housing, Race, Contaminated House-Dust, Water, Soil, Intoxication, Absorption, Abatement

Berti, P.R., Receveur, O., Chan, H.M. and Kuhnlein, H.V. (1998), Dietary exposure to chemical contaminants from traditional food among adult Dene/Métis in the western Northwest Territories, Canada. *Environmental Research*, **76** (2), 131-142.

Full Text: [E\Env Res76, 131.pdf](E/Env%20Res76,%20131.pdf)

Abstract: Environmental contaminants such as organochlorines and heavy metals have been reported to bioaccumulate in Arctic and subarctic wildlife, The Indigenous Peoples in northern and Arctic Canada rely on local wildlife as an important food source, and it is thus hypothesized that they may have high intakes of these contaminants. Herein, an assessment of dietary exposure to selected organochlorines and heavy metals for Indigenous Peoples of the western Northwest Territories (NWT) is presented. Dietary data were collected from 1012 adults with 24-h recalls in 16 communities in the western NWT (Denendeh). A comprehensive survey of the literature, as well as in-house analysis, formed the basis of a large traditional food-contaminant database, By combining the dietary and contaminant data, dietary exposure to 11 chemical contaminants was calculated. Dietary exposure to chemical contaminants in Denendeh is generally low and there is little, if any, associated health risk, However there are specific contaminants in certain communities for which exposure on a single day approaches the tolerable daily intake levels, These situations are detailed and monitoring needs are described. (C) 1998 Academic Press.

Keywords: Indigenous People, Heavy Metals, Organochlorines, Arctic, Ecosystem Contamination, Indigenous Peoples

Yang, C.Y., Chiu, H.F., Cheng, M.F. and Tsai, S.S. (1998), Chlorination of drinking water and cancer mortality in Taiwan. *Environmental Research*, **78** (1), 1-6.

Full Text: [E\Env Res78, 1.pdf](E/Env%20Res78,%201.pdf)

Abstract: Chlorination has been the major strategy for disinfection of drinking water in Taiwan. An ecologic epidemiological study design was used to examine whether chlorination of drinking water was associated with cancer risks. A “chlorinating municipality” (CHM) was defined as one in which more than 90% of the municipality population was served by the chlorinated water while an “nonchlorinating municipality” (NCHM) was one in which less than 5% of the municipality population was served by chlorinated water. Age-adjusted mortality rates for cancer during 1982-1991 among the 14 CHMs were compared to rates among the 14 matched NCHMs with similar urbanization level and sociodemographic characteristics. The results of this study suggest a positive association between consumption of chlorinating drinking water and cancer of the rectum, lung, bladder, and kidney. Although these findings must be interpreted with caution because of limitations in the ecological study design, their public health significance should not be disregarded because chlorination of water is so widely practiced in Taiwan.

Keywords: Chlorination, Drinking Water, Cancer, Mortality, Epidemiology, Hepatocellular-Carcinoma, Bladder-Cancer, By-Products, Well Water, Trihalomethanes, Migration, Louisiana, Disease, Smoking, Rates

Wyatt, C.J., Quiroga, V.L., Acosta, R.T.O. and Mendez, R.O. (1998), Excretion of arsenic (As) in urine of children, 7-11 years, exposed to elevated levels of As in the city water supply in Hermosillo, Sonora, México. *Environmental Research*, **78** (1), 19-24.

Full Text: [E\Env Res78, 19.pdf](E/Env%20Res78,%2019.pdf)

Abstract: Arsenic (As) is a common element in the environment with many industrial uses, but it also can be a contaminant in drinking water and present serious health concerns. Earlier studies on the quality of drinking water in the city of Hermosillo, Sonora, Mexico, showed high levels of As (>0.05 ppm) in water from wells located in the northern part of the city. Additionally a high positive correlation between the levels of Fluoride (F) and As in the same wells was found. Therefore, the objective of this study was to determine the excretion of As in children, 7-11 years of age, that had been exposed to elevated levels of As in their drinking water. Twenty-four-hour urine samples and a water sample taken directly in the home were collected from school age children Living in two different areas with known high levels of As in their drinking water. A control group with normal levels of As in their water was also included. As was determined by an atomic absorption-hydride generator, verified with the use of NBS certified standards (SRM 1643a and SRM 2670). None of the water samples exceeded the limit established for drinking water, however, there was a significant difference between the intake of As and the As in drinking water among the three areas of the study. Average As in water was 0.009±0.002 and 0.030±0.011 µg/ml between the control and high areas. Intake (in µg/day) was 15±3 and 54±18. In the group consuming water with high levels of As, 65% of the children exceeded the recommended dose of <1 µg/kg/day (EPA, 1988). Several children in this study also had high levels of As in their urine. Even though As levels in the drinking water are within the norms, it appears that children exposed to high levels of As in their drinking water may have a health risk. (C) 1998 Academic Press.

Keywords: As, Drinking Water, Urine, Northern Mexico, Disease Endemic Area, Malignant Neoplasms, Taiwan

Lybarger, J.A., Lee, R., Vogt, D.P., Perhac, Jr., R.M., Spengler, R.F. and Brown, D.R. (1998), Medical costs and lost productivity from health conditions at volatile organic compound-contaminated superfund sites. *Environmental Research*, **79** (1), 9-19.

Full Text: [E\Env Res79, 9.pdf](E/Env%20Res79,%209.pdf)

Abstract: This paper estimates the health costs at Superfund sites for conditions associated with volatile organic compounds (VOCs) in drinking water. Health conditions were identified from published literature and registry information as occurring at excess rates in VOC-exposed populations. These health conditions were: (1) some categories of birth defects, (2) urinary tract disorders, (3) diabetes, (4) eczema and skin conditions, (5) anemia, (6) speech and hearing impairments in children under 10 years of age, and (7) stroke. Excess rates were used to estimate the excess number of cases occurring among the total population living within one-half mile of 258 Superfund sites. These sites had evidence of completed human exposure pathways for VOCs in drinking water. For each type of medical condition, an individual’s expected medical costs, long-term care costs, and lost work time due to illness or premature mortality were estimated. Costs were calculated to be approximately $330 million per year, in the absence of any remediation or public health intervention programs. The results indicate the general magnitude of the economic burden associated with a limited number of contaminants at a portion of all Superfund sites, thus suggesting that the burden would be greater than that estimated in this study if all contaminants at all Superfund sites could be taken into account.

Keywords: Costs, Economic Impact, Superfund, Hazardous Waste, Volatile Organic Compounds, Congenital-Malformations

Guo, H.R., Lipsitz, S.R., Hu, H. and Monson, R.R. (1998), Using ecological data to estimate a regression model for individual data: The association between arsenic in drinking water and incidence of skin cancer. *Environmental Research*, **79** (2), 82-93.

Full Text: [E\Env Res79, 82.pdf](E/Env%20Res79,%2082.pdf)

Abstract: In ecologic studies, participants are studied by groups, and the exposure status of each group is usually represented by a single indicator, mostly the mean exposure. In this paper, we propose using multiple variables derived from dummy variables at the individual level to describe the exposure. An analysis of the association between arsenic in drinking water and skin cancer was used as an example, Well water arsenic levels and skin cancer incidence from 1980 to 1987 mere assessed for 243 townships in Taiwan. We first analyzed the data using the mean arsenic concentration in each township as the only exposure variable. The second analysis used multiple variables to describe arsenic exposure, each variable denoted the percentage of wells with arsenic levels within a specific range in each township. Although the first approach did not identify associations between arsenic levels and skin cancer, the multiple-variable approach identifies a positive association at the highest arsenic exposure category (>0.64 mg/L) in both men and women. Therefore, using multiple variables to describe an exposure in ecologic studies may facilitate a better description of the exposure status and thereby lead to more accurate risk assessment, especially when the dose-response relationship is not linear. (C) 1998 Academic Press.

Keywords: Ecologic Studies, Arsenic, Water, Skin Cancer, Epidemiology, Essential Trace-Elements

Gelberg, K.H., Church, L., Casey, G., London, M., Roerig, D.S., Boyd, J. and Hill, M. (1999), Nitrate levels in drinking water in rural New York State. *Environmental Research*, **80** (1), 34-40.

Full Text: [E\Env Res80, 34.pdf](E/Env%20Res80,%2034.pdf)

Abstract: To obtain an indication of the nitrate-nitrogen levels in drinking water in rural areas of upstate New York and the number of infants at risk for methemoglobinemia, 419 wells supplying drinking water to farms were tested. Farmers were identified through two programs run by the New York State Department of Health. The farmers were asked to complete a short questionnaire about the type and size of their farm and their well and to collect the water sample. Overall, nitrates were detectable in 95% of the wells tested (concentration levels greater than 0.05 mg/L) and 15.7% had levels which exceedded 10 mg/L. Fifteen percent of the wells tested from farms where infants resided were also elevated. Wells which were shallow, dug or located on large farms, or springs were more likely to have elevated concentrations of nitrates. (C) 1999 Academic Press.

Keywords: Nitrates, Agriculture, Methemoglobinemia, Water

Mergler, D. (1999), Neurotoxic effects of low level exposure to manganese in human populations. *Environmental Research*, **80** (2), 99-102.

Full Text: [E\Env Res80, 99.pdf](E/Env%20Res80,%2099.pdf)

Keywords: Nervous-System, Workers

Falk, C., Hanrahan, L., Anderson, H.A., Kanarek, M.S., Draheim, L., Needham, L. and Patterson, Jr., D. (1999), Body burden levels of dioxin, furans, and PCBs among frequent consumers of Great Lakes sport fish. The Great Lakes Consortium. *Environmental Research*, **80** (2), S19-S25.

Full Text: [E\Env Res80, S19.pdf](E/Env%20Res80,%20S19.pdf)

Abstract: Dioxins, furans, and polychlorinated biphenyls (PCBs) are toxic, persist in the environment, and bioaccumulate to concentrations that can be harmful to humans. Sport anglers may be exposed to these residues via consumption of contaminated Great Lakes (GL) fish. The Health Departments of five GL states, Wisconsin, Michigan, Ohio, Illinois, and Indiana, formed a consortium to study body burden levels of chemical residues in fish consumers of Lakes Michigan, Huron, and Erie. In Fall 1993, a telephone survey was administered to sport angler households to obtain fish consumption habits and demographics. A blood sample was obtained from a portion of the study subjects. One hundred serum samples were analyzed for 8 dioxin, 10 furan, and 4 coplanar PCB congeners. Multiple linear regression was conducted to assess the predictability of the following covariates: GL sport fish species, age, BMI, gender, years sport fish consumed, and lake. of the 100 subjects, there were 58 men, 35 consumed sport fish from Lake Michigan, 29 from Lake Huron, and 36 from Lake Erie. The overall average number of GL sport fish meals consumed in the previous 12 months was 43. Lake Erie male and female consumers, on average, ate more GL sport fish, a mean of 57 and 42 meals, respectively, than men and women from the other two lake subgroups. Median total dioxin toxic equivalents (TEq), total furan TEq, and total coplanar PCB TEq were higher among all men than all women (P = 0.0001). Lake trout, salmon, age, BMI, and gender were significant regression predictors of log (total coplanar PCBs). Lake trout, age, gender, and lake were significant regression predictors of log (total furans). Age was the only significant predictor of total dioxin levels. Copyright 1999 Academic Press.

Liu, Q., Jiao, Q.C., Huang, X.M., Jiang, J.P., Cui, S.Q., Yao, G.H., Jiang, Z.R., Zhao, H.K. and Wang, N.Y. (1999), Genotoxicity of drinking water from Chao Lake. *Environmental Research*, **80** (2), 127-131.

Full Text: [E\Env Res80, 127.pdf](E/Env%20Res80,%20127.pdf)

Abstract: Genotoxic activity appears to originate primarily from reactions of chlorine with humic substances in the source waters. Comparisons of extracts of settled versus chlorinated water have confirmed that chlorinating during water treatment produces mutagenic activity in the mutagenicity tests. Present work on XAD-P extracts of raw, chlorinated (treated), and settled water from the Chao Lake region of China has involved a battery of mutagenicity assays for various genetic endpoints: the Salmonella test, the sister-chromatid exchange (SCE) induction in Chinese hamster lung (CHL) cells, and the micronucleus (MN) induction in the peripheral blood erythrocytes of silver carp. Extracts of raw and treated water but not the settled water are mutagenic in the Salmonella assay. On the other hand, extracts of three water samples show activity in the SCE and MN assays, especially the raw and treated water. These data show that contamination and chlorinating contribute mutagens to drinking water and suggest that the mammalian assays may be more sensitive for detecting mutagenicity in aquatic environment than the Salmonella test. (C) 1999 Academic Press.

Keywords: Micronucleus

Carraro, E., Gasparini, S. and Gilli, G. (1999), Identification of a chemical marker of environmental exposure to formaldehyde. *Environmental Research*, **80** (2), 132-137.

Full Text: [E\Env Res80, 132.pdf](E/Env%20Res80,%20132.pdf)

Abstract: Formaldehyde (P) binds human serum albumin (HSA) covalently, giving rise to a molecular adduct F-HSA having the F as hapten. The humoral immune response to the adduct provides a biological marker of F exposure. In order to titrate serum anti-F-HSA antibodies, a new indirect competitive enzyme immunoassay (displacement assay) was developed. Two groups of about 90 heterogeneous healthy subjects were examined using two in vitro conjugated F-HSA adducts with different ratios be tween F and HSA (5: 1 and 10: 1), Contingency table analysis showed a greater sensitivity (97%) and specificity (92%) of the test with the 10: 1 F-HSA adduct than with the 5: 1. Data examination using multivariate analysis of variance revealed that in both groups the smoking variable significantly explains (P < 0.01) the values of the F exposure marker. A significant association with immunological response was obtained only in male smokers, using 5: 1 F-HSA adduct, while with 10: 1 ratio, a good association in male and female smokers was found. Results confirm that the immunological assay developed (displacement assay) could be a useful method for evaluating F exposure, especially for public health monitoring on a large scale. (C) 1999 Academic Press.

Keywords: Formaldehyde, Exposure Biomarker, F-Hsa Adduct, Displacement Assay, Antibodies

Alavanja, M.C.R., Sandler, D.P., McDonnell, C.J., Lynch, C.F., Pennybacker, M., Zahm, S.H., Mage, D.T., Steen, W.C., Wintersteen, W. and Blair, A. (1999), Characteristics of pesticide use in a pesticide applicator cohort: The Agricultural Health Study. *Environmental Research*, **80** (2), 172-179.

Full Text: [E\Env Res80, 172.pdf](E/Env%20Res80,%20172.pdf)

Abstract: Data on recent and historic pesticide use, pesticide application methods, and farm characteristics were collected from 35, 879 restricted-use pesticide applicators in the first 2 years of the Agricultural Health Study, a prospective study of a large cohort of private and commercial licensed pesticide applicators that is being conducted in Iowa and North Carolina. (In Iowa, applicators are actually “certified, “ while in North Carolina they are “licensed”, for ease of reference the term license will be used for both states in this paper.) Commercial applicators (studied in Iowa only) apply pesticides more days per year than private applicators in either state. When the types of pesticides being used by different groups are compared using the Spearman coefficient of determination (r2), we find that Iowa private and Iowa commercial applicators tend to use the same type of pesticides (r2 = 0.88). White and non-white private applicators tended to use the same type of pesticides (North Carolina r2 = 0.89), as did male and female private applicators (Iowa r2 = 0.85 and North Carolina r2 = 0.84). There was less similarity (r2 = 0.50) between the types of pesticides being used by Iowa and North Carolina private applicators. A greater portion of Iowa private applicators use personal protective equipment than do North Carolina private applicators, and pesticide application methods varied by state. This heterogeneity in potential exposures to pesticides between states should be useful for subsequent epidemiologic analyses using internal comparison groups. (C) 1999 Academic Press.

Keywords: Pesticides, Occupational Exposure, Cancers, Noncancer Toxicity, Farmers, Breast-Cancer, Herbicides, Residues, Exposure, Farmers, Workers, Risk

Alavanja, M.C.R., Sandler, D.P., McDonnell, C.J., Mage, D.T., Kross, B.C., Rowland, A.S. and Blair, A. (1999), Characteristics of persons who self-reported a high pesticide exposure event in the Agricultural Health Study. *Environmental Research*, **80** (2), 180-186.

Full Text: [E\Env Res80, 180.pdf](E/Env%20Res80,%20180.pdf)

Abstract: Characteristics of persons who report high pesticide exposure events (HPEE) were studied in a large cohort of licensed pesticide applicators from Iowa and North Carolina who enrolled in the Agricultural Health Study between December 1993 and December 1995. Fourteen percent reported having “an incident or experience while using any pesticide which caused an unusually high personal exposure.” After taking into account total number of applications made and education, females (OR = 0.76), applicators from NC (OR = 0.65), and privately licensed applicators (OR = 0.65) were less likely to have reported an HPEE. Work practices more common among both private and commercial applicators with an HPEE included delay in changing clothing or washing after pesticide application, mixing pesticide application clothing with the family wash, washing up inside the house after application, applying pesticides within 50 yards of their well, and storing pesticides in the home. Job characteristics more common among those with an HPEE included self-repair of application equipment and first pesticide use more than 10 years in the past. These job characteristics explained much of the difference in reported HPEE between males and females, but not between IA and NC subjects or between commercial or private applicators. (C) 1999 Academic Press.

Keywords: Pesticides, Pesticide Poisoning, Accidental Exposures, Farmers, Exposure Assessment

Kim, H., Haltmeier, P., Klotz, J.B. and Weisel, C.P. (1999), Evaluation of biomarkers of environmental exposures: Urinary haloacetic acids associated with ingestion of chlorinated drinking water. *Environmental Research*, **80** (2), 187-195.

Full Text: [E\Env Res80, 187.pdf](E/Env%20Res80,%20187.pdf)

Abstract: A study was conducted to determine if DCAA and TCAA urinary excretion rates are valid biomarkers of chronic ingestion exposure to these disinfection by-products of chlorination of drinking water. Entire first morning urine voids, time-of-visit urine samples, and tap water samples were collected from 47 female subjects. In addition, a 48-h recall questionnaire was administered to determine the amounts and types of liquids ingested by each subject as well as other exposures that could lead to DCAA and TCAA urinary excretion. The TCAA excretion rate for the first morning urine samples was significantly correlated with the estimated 48-h TCAA ingestion exposure for 25 subjects whose ingestion exposures primarily occurred at home, while the DCAA excretion rate was not correlated with the DCAA ingestion exposure. Thus, urinary TCAA appears to be a valid biomarker of chronic ingestion exposure to TCAA from chlorinated water, while urinary DCAA is not. It is proposed that the difference in the biological half-lives between these two compounds is the rationale for this finding. The biological half-life of TCAA is longer than successive exposure intervals, thus TCAA accumulates until it reaches a steady state, The half-life of DCAA is shorter than successive exposure intervals, thus DCAA is almost completely metabolized following an exposure and is eliminated from the body. This study suggests that biological half-life, exposure interval, and sample collection interval should be considered in selecting biomarkers and designing studies to validate them. (C) 1999 Academic Press.

Keywords: Biomarker, Chlorinated Tap Water, Dichloroacetic Acid, Ingestion Exposure, Questionnaire, Trichloroacetic Acid, Urinary Excretion, Trichloroacetic-Acid, Dichloroacetic Acid, Gas-Chromatography, Reaction-Products, Humic Substances, Chloral Hydrate, Bladder-Cancer, Carcinogenicity, Metabolites, Mouse

Hanrahan, L.P., Falk, C., Anderson, H.A., Draheim, L., Kanarek, M.S. and Olson, J. (1999), Serum PCB and DDE levels of frequent Great Lakes sport fish consumers: A first look. The Great Lakes Consortium. *Environmental Research*, **80** (2), S26-S37.

Full Text: [E\Env Res80, S26.pdf](E/Env%20Res80,%20S26.pdf)

Abstract: Great Lakes (GL) sport fish consumption is a potential human exposure route for polychlorinated biphenyls (PCBs) and dichlorodiphenyl dichloroethene (DDE). Because of fish tissue contamination, frequent consumers of Great Lakes sport caught fish (GLSCF) may be at risk for PCB and DDE accumulation. To examine this problem, the Health Departments of Wisconsin, Illinois, Indiana, Ohio, and Michigan formed a health assessment consortium. Participants were contacted by telephone to complete a detailed demographic and fish consumption survey. Frequent and infrequent, G.L., SCF consumers were identified, and a participant subset was then asked to donate blood for PCB and DDE analysis. Analysis of variance (ANOVA) was done to study exposure group mean differences, while correlation and regression analyses were performed to examine relationships between demographic characteristics, GLSCF consumption, PCB, and DDE body burdens. A total of 4206 individuals participated in the study. of these, 2542 were habitual GLSCF consumers (mean greater than 35 meals/year males, greater than 27 meals/year females), while 1664 did not eat, G.L., SCF. A subset of 538 participants donated blood and included 439 frequent and 99 infrequent, G.L., SCF consumers. PCB levels were significantly higher in the group of GLSCF consumers (geometric mean: 4.8 ppb males, 2.1 ppb females) when compared to their referents (geometric mean: 1.5 ppb males, 0.9 ppb females), while DDE levels were also higher for GLSCF consumers. PCB and DDE body burdens varied by exposure group, gender, and great lake (Michigan, Huron, Erie). PCB and DDE levels were significantly correlated to age, body mass index, and sport fish and Great Lakes sport fish consumption histories. Regression analysis identified years of consuming sport caught fish as the most robust predictor of PCBs (r2 = 25%), while age was the best predictor of DDE levels (r2 = 21%). This study corroborated previous findings relating frequent, G.L., SCF consumption to a higher body burden for PCBs and DDE. Copyright 1999 Academic Press.

Keywords: Great Lakes, Fish Consumption, PCBs, DDE, Organochlorines, Polychlorinated-Biphenyls, Consumption, Contaminants, Exposure, Health

Seegal, R.F. (1999), Are PCBs the major neurotoxicant in Great Lakes salmon? *Environmental Research*, **80** (2), S38-S45.

Full Text: [E\Env Res80, S38.pdf](E/Env%20Res80,%20S38.pdf)

Abstract: Epidemiological studies have demonstrated an association between consumption, by women, of contaminated Great Lakes salmon and deficits in cognitive performance in the children of these women. Although significant statistical associations between polychlorinated biphenyl (PCB) body burdens and these negative outcomes suggest that PCBs may be responsible, the fetus and neonate are also exposed to other fish-borne neurotoxicants. In this manuscript we present data from two developmental studies that support the hypothesis that PCBs may serve either as a marker for other contaminants that are responsible for the observed effects, or that other contaminants present in the fish interact synergistically with the PCBs to produce the observed neurotoxicity. In the first study we demonstrated that exposure of rats to diets containing lyophilized Great Lakes salmon, resulting in exposure to as little as 13.9 micrograms/ (kg small middle dotday) of total PCBs, induced significant reductions in regional brain dopamine (DA) concentrations. In the second study, we demonstrated that exposure of rats to the ortho-substituted PCB congener (2, 4, 2’, 4’-tetrachloro-biphenyl) at 1, 10 or 20 mg/ (kg small middle dotday) also induced significant reductions in DA concentrations in the same brain regions although only at the two highest doses-levels at least 100-fold higher than seen in the first study. On the basis of these developmental neurochemical studies we suggest that the reported cognitive deficits in children exposed in utero and during lactation to fish-borne contaminants may be due either to contaminants other than PCBs or to complex interactions between PCBs and other neurotoxicants present in the fish. Copyright 1999 Academic Press.

Kosatsky, T., Przybysz, R., Shatenstein, B., Weber, J.P. and Armstrong, B. (1999), Fish consumption and contaminant exposure among Montreal-area sportfishers: Pilot study. *Environmental Research*, **80** (2), S150-S158.

Full Text: [E\Env Res80, S150.pdf](E/Env%20Res80,%20S150.pdf)

Abstract: A 1995 pilot study assessed sport fish consumption and contaminant exposure among Montreal-area residents fishing the frozen St. Lawrence River. Interviews conducted among 223 ice fishers met on-site were used to create an index of estimated exposure to fish-borne contaminants. A second-stage assessment of sport fish consumption and tissue contaminant burdens included 25 interviewees at the highest level of estimated contaminant exposure (of 38, or 66% of those solicited) and 15 low-exposure fishers (of 41, or 37% of those solicited). High-level fisher-consumers reported eating 0. 92±0.99 sport fish meals/week during the previous 3 weeks compared to 0.38±0.21 (P<0.05) for the low-level group. Based on the product of consumption frequency times mass of sport fish meals consumed, high-level consumers ate a mean of 18.3 kg of sport fish annually versus 3.3 kg for the low-level consumers. Tissue contaminant assessments showed significant (P<0.05) groupwise differences: 0-1 cm hair mercury (median 0.73 microgram/g for the high versus 0.23 microgram/g for the low group), lipid-adjusted plasma PCB congeners (Aroclor 1260 (median 0.77 microgram/g versus 0.47 microgram/g), and lipid-adjusted plasma DDE (median 0.35 microgram/g versus 0.26 microgram/g). No participant had a hair mercury or plasma DDE concentration above Health Canada recommendations but 2/25 high-level participants (8%) had plasma Aroclor 1260 concentrations above recommended limits. The results of this pilot study suggest that a small number of Montreal-area sportfishers consume their catch as often as three times weekly and that those consuming sport fish frequently have significantly higher tissue levels of mercury, PCBs, and DDE than do infrequent consumers. On the other hand, compared to other groups in Quebec, such as the Inuit or commercial fishers on the North Shore of the Gulf of St. Lawrence, Montreal-area sportfishers eat less fish and have lower tissue concentrations of fish-related contaminants. Copyright 1999 Academic Press.

Raghunath, R., Tripathi, R.M., Kumar, A.V., Sathe, A.P., Khandekar, R.N. and Nambi, K.S.V. (1999), Assessment of Pb, Cd, Cu, and Zn exposures of 6- to 10-year-old children in Mumbai. *Environmental Research*, **80** (3), 215-221.

Full Text: [E\Env Res80, 215.pdf](E/Env%20Res80,%20215.pdf)

Abstract: Population exposures to toxic trace metals are of great concern due to their nonbiodegradable nature and long biological half-lives for elimination from the body. Response to a toxic metal varies with age group, children are more sensitive and hence more at risk than others. The present study was therefore undertaken on 6- to 10-year-old children residing in various localities of Greater Mumbai and Thane. Blood samples from 566 children residing in 13 locations in Mumbai along with 410 air particulate samples and 64 “duplicate diet” samples were collected for this study. Levels of Pb, Cd, Cu, and Zn in these samples were estimated by differential pulse anodic stripping voltammetric technique. Intake of Pb, Cd, Cu, and Zn for 6- to 10-year-old children through ingestion and inhalation pathways have also been assessed. A correlation coefficient of 0.88 is observed between air lead and blood lead. It is also seen that every microgram increase in the Pb concentration in air (m-3) results in 3.56 µg increase in the blood Ph concentration (dl-µ) in children. Similar correlation, however, was not observed in cases of Cd, Cu, and Zn. (C) 1999 Academic Press.

Keywords: Blood Lead Levels, Heavy-Metals

Wasserman, E. (1999), Environment, health, and gender in Latin America: Trends and research issues. *Environmental Research*, **80** (3), 253-273.

Full Text: [E\Env Res80, 253.pdf](E/Env%20Res80,%20253.pdf)

Abstract: Over the past several decades, Latin America underwent rapid urbanization, a demographic shift led by women. Women now make up almost half of the economically active population and the feminization of urban poverty is being reported as well. The majority of men and women now work in unregulated, unorganized “informal” and nontraditional industries and services lacking occupational and environmental regulations. There is a marked paucity of health studies examining possible hazardous exposures, especially where gender-based social etiologies are concerned. This is true even in concentrated industries such as manufacturing assembly plants and in potentially hazardous occupations in mining and nontraditional agricultural exports, for which data from other disciplines are available and raise serious concerns. The need to ensure enough jobs at sufficient levels of income to alleviate poverty will remain a major challenge at the turn of the century and the environmental health implications of doing so could be far-reaching. What data are available and, more strikingly, the paucity of published epidemiologic studies warrant deep concern and support calls for urgent, multidisciplinary research into the health effects of the combined, multiple assaults of hazardous industrial waste, inadequate water and sewage treatment, and occupational exposures. Given the complex and varied work roles of women, the information reviewed also points to the need to conduct such research in the region within a social-etiologic framework of gender analysis. Copyright 1999 Academic Press.

Greizerstein, H.B., Stinson, C., Mendola, P., Buck, G.M., Kostyniak, P.J. and Vena, J.E. (1999), Comparison of PCB congeners and pesticide levels between serum and milk from lactating women. *Environmental Research*, **80** (3), 280-286.

Full Text: [E\Env Res80, 280.pdf](E/Env%20Res80,%20280.pdf)

Abstract: Samples of blood and milk were obtained from lactating women participating in the New York State Angler study. A total of seven women gave one blood and one milk sample at time intervals between blood and milk collection different for each woman. The time between samples varied from 3 to 318 days. One subject provided a second milk sample 219 days after the first milk sample, The samples were analyzed for 69 PCB congeners, DDE (a metabolite of DDT), Mirex, and hexachlorobenzene (HCB), Lipid content was determined by gravimetric analysis. The congener profiles in serum and milk were similar for each individual but different among all subjects. The sum of the concentrations of the congeners present above the limit of detection was used to estimate the total PCB concentration that was in the range of 2.6 to 5.8 ng/g of serum and 3.5 to 14.1 ng/g of milk. The ratio of serum to milk concentrations varied from 0.18 to 1.66 with a mean of 0.65±0.49 showing no consistency among individuals prior to adjusting the data for lipid content. The total PCB levels normalized for lipid content were 320 728 ng/g of serum lipid and 239 428 ng/g of milk lipid. The range of the lipid adjusted serum/milk ratio was 1.1 to 2.8 and the mean±SD serum/milk ratio was 1.9±0.5, The ranges of lipid adjusted serum concentration of DDE, HCB, and Mirex were 95 to 591, 8 to 48, and 3 to 29 ng/g lipid, respectively, The ranges of lipid adjusted milk concentration of DDE, HCB, and Mirex were 90 to 577, 11 to 22, and 1 to 10 ng/g lipid, respectively. For DDE, HCB, and Mirex, the means of the individual lipid adjusted serum to milk ratios were 1.5±0.7 2.5±1.5, and 5.3±4.6, respectively. Considerable differences were found among lipid adjusted concentrations of these environmental pollutants in serum and milk samples from the same individual. This suggests that body burden estimates in lactating women using different matrices may not be equivalent even when lipid adjusted values are used. (C) 1999 Academic Press.

Keywords: Lactating Women, PCBs, Pesticides, Serum, Milk, Polychlorinated-Biphenyls, Adipose-Tissue, Organochlorine Pesticides, Coplanar PCBs, Blood-Levels, Breast-Milk, Exposure, Dioxins, PCDDs, PCDFs

Yang, C.Y., Tsai, S.S., Lai, T.C., Hung, C.F. and Chiu, H.F. (1999), Rectal cancer mortality and total hardness levels in Taiwan’s drinking water. *Environmental Research*, **80** (4), 311-316.

Full Text: [E\Env Res80, 311.pdf](E/Env%20Res80,%20311.pdf)

Abstract: The possible association between the risk of rectal cancer and hardness levels in drinking water from municipal supplies was investigated in a matched case-control study in Taiwan. All eligible rectal cancer deaths (986 cases) of Taiwan residents from 1990 through 1994 were compared with deaths from other causes (986 controls), and the hardness levels of the drinking water used by these residents were determined. Data on water hardness throughout Taiwan were collected from Taiwan Water Supply Corporation (TWSC). 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. The results show a significant negative relationship between drinking water hardness and rectal cancer mortality. Odds ratio and 95% confidence intervals were 1.24 (1.01-1.55) and 1.38 (1.10-1.73), respectively, for exposure to moderately hard water and soft water compared with the use of hard water. Trend analyses showed an increasing odds ratio for rectal cancer with decreasing levels of hardness in drinking water. This is an important finding for the Taiwan water industry and human health. Copyright 1999 Academic Press.

Keywords: Hardness, Drinking Water, Rectal Cancer, Calcium, Magnesium, Epithelial-Cell Proliferation, Colorectal-Cancer, Colon-Cancer, Cardiovascular Mortality, Calcium, Magnesium, Inhibition, Acids, Diet

Meyer, I., Heinrich, J. and Lippold, U. (1999), Factors affecting lead, cadmium, and arsenic levels in house dust in a smelter town in eastern Germany. *Environmental Research*, **81** (1), 32-44.

Full Text: [E\Env Res81, 32.pdf](E/Env%20Res81,%2032.pdf)

Abstract: Hettstedt, a city in eastern Germany with a long history of mining and smelting of nonferrous ores, has several industrial sources of heavy metals. The indoor exposure to metals of children (5 to 14 years old) in the Hettstedt area was assessed by measuring the levels of lead, cadmium, and arsenic contamination in sedimented house dust. Factors which influence the dust loading rate and the surface loading rates of these contaminants in house dust were investigated. The geometric mean of the dust loading rate was 8.9 mg/m2 day. The geometric means of surface loading rates were 1.14, 0.024, and 0.023 µg/m2 day for lead, cadmium, and arsenic, respectively. Factors that were significantly associated with surface loading rates included the city area of residence, automobile traffic near home, parent with occupational exposure to heavy metals, type of heating, housing characteristics, whether child’s home is damp, number of persons living in the child’s home, and parents’ education. The most significant of these factors was the city area of residence, which reflects the distance from the metal sources, this factor accounted for about half of the variances explained by the regression models. (C) 1999 Academic Press.

Keywords: House Dust, Lead, Cadmium, Arsenic, Children, Blood Lead, Urban Children, Exposure, Contamination, Soils, Community, Burden, Environment, Absorption, Particles

Mielke, H.W., Gonzales, C.R., Smith, M.K. and Mielke, P.W. (1999), The urban environment and children’s health: Soils as an integrator of lead, zinc, and cadmium in New Orleans, Louisiana, USA. *Environmental Research*, **81** (2), 117-129.

Full Text: [E\Env Res81, 117.pdf](E/Env%20Res81,%20117.pdf)

Abstract: Soils are evaluated as a diagnostic tool of environmental conditions that influence health. The samples for this study are urban topsoil (0-2.5 cm depth) samples (n = 4026) analyzed for Pb, Zn, and Cd by inductively coupled plasma-atomic emission spectrometry (ICP-AES). The parent materials for New Orleans soils are derived from the Mississippi River, and alluvium from the Bonnet Carre Spillway (n = 31) serve as control samples for this study. The urban samples were stratified by census tract (n = 286). Blood Pb (BL) levels of children less than or equal to 6 years were also stratified by census tract and paired with soil Pb (SL) (n = 175). A significant association (P = 1.2×10-23) was found between median BL and median SL. The association was modeled by BL = 3.06 + 0.33 (SL)(0.5) (correlation coefficient = 0.69 between the modeled BL and the observed BL and P = 3.5×10-22). A median SL threshold (greater than or equal to 310 µg g-1 and <310 µg g-1) for higher metal census tracts (HMCTs) and lower metal census tracts (LMCTs), respectively, represents median BL exposures above and below 9 µg dL-1. HMCTs and LMCTs were characterized by demographic and socioeconomic data. HMCTs are more likely (P = 4.5×10-6) inhabited by Blacks than by Whites. of 13, 803 children less than or equal to 6 years in HMCTs, 75% are Black and 22% are White, with other making up the remaining 3%. In LMCTs, the Black to White children ratio is 50: 50. In HMCTs, socioeconomic indicators for Blacks are depressed compared to Whites. Zn and Cd are potentially phytotoxic in HMCTs. Children exhibit a steep rise in BL at SL < 100 µg g-1, and empirically, a safe SL for most children is around 80 µg g-1. SL is a useful diagnostic tool, and curtailing SL may complement primary Pb prevention for children. (C) 1999 Academic Press.

Keywords: Lead Poisoning, Urban Geochemistry, Urban Soil Pb Map, Zn and Cd Phytotoxicity, Environmental Justice, Blood Lead, National-Health, United-States, Exposure, Nhanes

Sterling, D.A., Roegner, K.C., Lewis, R.D., Luke, D.A., Wilder, L.C. and Burchette, S.M. (1999), Evaluation of four sampling methods for determining exposure of children to lead-contaminated household dust. *Environmental Research*, **81** (2), 130-141.

Full Text: [E\Env Res81, 130.pdf](E/Env%20Res81,%20130.pdf)

Abstract: Childhood exposure to lead has been demonstrated to result in health effects and lead-contaminated household dust is a primary exposure source. There is a need to establish reliable methods for sampling surfaces to determine levels of lead contamination, Three vacuums (HVS3, GS80, and MVM) and one wipe method were evaluated for the collection of household floor dust under field sampling conditions within a Superfund site and demographically similar control area, Side-by-side floor samples were taken from three locations within 41 randomly selected households between August and September 1995: a child’s bedroom, primary play area, and primary entrance. Analysis was pel formed to assess the relative collection performance of each sampler, spatial distribution of lead within a household, and correlation of lead loading with observed blood lead level, and to determine if discrete- or composites samples were more predictive of blood lead levels, Approximately 90% of the floor surfaces were carpeted, The rank order of sampling methods from greatest to lowest collection efficiency was HVS3 > GS80 > wipe > MVM, The HVS3 had the highest level of precision (CV = 0.05), with the GS80 and wipe precisions 0.48 and 0.053, respectively, Lead loadings for samples collected in bedrooms and living areas and composite samples using the HVS3 and wipe methods were significantly correlated with blood lead levels. Correlations between blood lead levels and composite samples were stronger for the HVS3 (R2 = 0.33, P = 0.003) and wipe (R2 = 0.25, P = 0.002) methods than the respective discrete samples. Regression analysis indicated that a blood lead level of 10 µg/dl corresponds to a carpet wipe sample geometric mean of 68 µg/ft2. For ongoing public health purposes, such as screening and clearance testing, use of the wipe sampling method is the most appropriate. This investigation supports findings by others that the present HUD risk levels for lead in floor wipe samples may not be adequate for reducing children’s blood lead levels below 10 µg/dl. (C) 1999 Academic Press.

Keywords: Lead, Dust Sampling Methods, Exposure Assessment, Wipe Sampling, Vacuum Sampling, Blood Lead, Sample Location, Blood Lead, Urban Children, Hand Dust, Environment, Childhood, Vacuum

Rust, S.W., Kumar, P., Burgoon, D.A., Niemuth, N.A. and Schultz, B.D. (1999), Influence of bone-lead stores on the observed effectiveness of lead hazard intervention. *Environmental Research*, **81** (3), 175-184.

Full Text: [E\Env Res81, 175.pdf](E/Env%20Res81,%20175.pdf)

Abstract: Lead hazard interventions have reduced children’s blood-lead concentrations, but do not eliminate lead altogether from the bloodstream. Several studies suggest that blood-lead concentrations, measured 6 to 12 months after such interventions, decline by approximately 25%. The Environmental Protection Agency is preparing to promulgate a rule prescribing residential lead levels in paint, dust, and soil that constitute a lead-based paint hazard. Such a rule will prompt interventions of primary prevention character (i.e., precluding exposure before it occurs) rather than the secondary prevention character interventions (i.e., alleviating exposure after it has adversely affected the resident child) documented in the literature. It is important to attempt to estimate the efficacy achieved from the primary prevention interventions prompted by the rule’s promulgation. As bone-lead stores represent the principal confounding factor to relating secondary prevention results to primary prevention, this paper addresses the impact of lead stored in bone, which may later be released to the blood and other parts of the child’s body. A simple, but thoroughly documented, modeling exercise is presented to estimate the maximum length of time for which bone-lead stares alone could account for continuing elevated blood-lead levels observed in children following an intervention, The approach is based on a two-compartment model for the transfer of lead between blood and bone tissues within the body and the elimination of lead from the body, Modeling results suggest that bone-lead mobilization can impact blood-lead levels of young children for considerably long periods following an intervention, These results may explain the seemingly contradictory fact that low declines in blood-lead concentrations are observed despite the significant reduction in residential dust-, paint-, and soil-lead levels observed following lead hazard interventions. An intervention which reduces a B-year-old child’s total lead exposure by 50% might, due to mobilized bone-lead stores, produce only a 25% decline in the child’s blood-lead concentrations measured 12 months following the intervention. The results also suggest, however, that those intervention strategies for which less than 25% declines were observed 12 months following the intervention likely eliminated less than 50% of the children’s total lead exposure. (C) 1999 Academic Press.

Keywords: Lead Hazard Intervention, Bone-Lead Mobilization, Effectiveness of Intervention, Compartmental Model, Blood Lead, Occupational Exposure, Human Tissues, Children, Metabolism, Kinetics, Skeleton, Isotope, Body, End

Morita, A., Kusaka, Y., Deguchi, Y., Moriuchi, A., Nakanaga, Y., Iki, M., Miyazaki, S. and Kawahara, K. (1999), Acute health problems among the people engaged in the cleanup of the Nakhodka oil spill. *Environmental Research*, **81** (3), 185-194.

Full Text: [E\Env Res81, 185.pdf](E/Env%20Res81,%20185.pdf)

Abstract: To determine if the Nakhodka oil spill and subsequent cleanup efforts had any health effects on the residents along the oil-contaminated coast, we investigated the health status of Anto residents who resided nearest to the coast where the bow ran aground. Two hundred eighty-two men and women involved in the cleanup activities between January 7 and January 20 were interviewed and examined by *Public Health Nurs*es to determine whether they suffered physical symptoms after exposure to the oil spill. Urine examinations for hydrocarbon toxicological markers were performed on 97 residents. The average number of days worked on cleanup activities was 4.7 days for men and 4.3 for women. Seventeen percent of the subjects had worked on cleanup activities for more than 10 days. Protective equipment was used against direct exposure to oil during the cleanup jobs and consisted of gloves used by almost 100% of the subjects and masks used by 87.1% of women and by only 35.4% of men. Glasses were worn by less than 30% of the subjects. Many symptoms emerged after the beginning of cleanup activities. The principal symptoms included low back pain and leg pain, headache, and symptoms of eyes and throat. Among the subjects undergoing urine tests, only three people showed a higher level of hippuric acid, although they returned to normal in the second examination. Accordingly, the exposure to the oil and the subsequent cleanup efforts were suggested to inflict acute health problems on local residents.

Neuberger, M., Rappe, C., Bergek, S., Cai, H., Hansson, M., Jager, R., Kundi, M., Lim, C.K., Wingfors, H. and Smith, A.G. (1999), Persistent health effects of dioxin contamination in herbicide production. *Environmental Research*, **81** (3), 206-214.

Full Text: [E\Env Res81, 206.pdf](E/Env%20Res81,%20206.pdf)

Abstract: A total of 159 cases of chloracne reported in 1969-1975 in TCDD-contaminated production of the herbicide 2, 4, 5-T have been followed for mortality and morbidity up to 1996 when blood and urine tests were performed on 50 survivors of these exposed chemical workers and matched controls. In exposed, the most frequent cause of sick leave was chloracne which persisted in 32%, Neurological symptoms were reported frequently (44% sleep disturbance, 32% headache, 30% neuralgia), BSR, leucocytes, gamma-GT SGOT, and SGPT were significantly higher in exposed than in controls, The effects of exposure (P = 0.002) and alcohol (P = 0.002) on gamma-GT were found to be independent of each other, Comparisons within the chloracne cohort showed significantly exposed TCDD per gram blood lipid in patients with a history of liver disease (mean 801 pg/g) than without (mean 407 pg/g), Other congeners were not found elevated but some higher chlorinated furans and PCBs were found reduced in patients with liver disease. In multiple regression analysis with the factors age, alcohol, and log TCDD, the effects of TCDD and its interaction with age were found significant, indicative of chronic liver damage after high TCDD exposure at a young age. The prevalence of neurological symptoms and signs of chronic liver disease were related to TCDD in blood and abnormal poryphyrins in urine. In 48% coproporphyrin I>III ratio was elevated, this group showing increased TCDD (mean 719 pg/g), These results contribute to the evidence that chloracne is not the only chronic disease which can be related to TCDD exposure, even 23 years after exposure and despite high intersubject variability of TCDD half-life and other exposures. (C) 1999 Academic Press.

Keywords: Chloracne, 2,3,7,8-Tetrachlorodibenzo-p-Dioxin, Occupational Disease, Liver Disease, Porphyrin Metabolism, 2,3,7,8-Tetrachlorodibenzo-p-Dioxin TCDD, Uroporphyrinogen Decarboxylase, International Cohort, Phenoxy Herbicides, Cancer Mortality, Ah-Receptor, Workers, Exposure, Toxicity, Chlorophenols

Hayward, D.G., Nortrup, D., Gardner, A. and Clower, M. (1999), Elevated TCDD in chicken eggs and farm-raised catfish fed a diet with ball clay from a southern United States mine. *Environmental Research*, **81** (3), 248-256.

Full Text: [E\Env Res81, 248.pdf](E/Env%20Res81,%20248.pdf)

Abstract: The U.S. Food and Drug Administration (FDA) terminated the use of ball clay from a mine in Mississippi as an additive in animal feed after discovering nanogram per gram concentrations of 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). The FDA collected chicken eggs and farm-raised catfish in affected areas and throughout the remaining continental United States to assess levels of 2,3,7,8-TCDD. A new method using quadrupole ion storage tandem-in-time mass spectrometry (QISTMS) measured the 2,3,7,8-TCDD levels in 42 catfish fillet composites, 3 Tilapia fillet composites, 46 chicken egg samples, and 6 chicken feeds. Six catfish composites and 20 egg samples had 2,3,7,8-TCDD concentrations significantly above 1.0 pg/g wet weight of fillet or whole egg. Farm-raised catfish not exposed to feed containing ball clay had a mean 2,3,7,8-TCDD concentration of 0.12 pg/g. The TCDD isomer pattern in ball clay differed from the TCDD isomer pattern in a fly ash sample and from the “chick edema factor” TCDD pattern in a sample of reference toxic fat used as a feed ingredient in the 1950s.

Keywords: Dibenzo-p-Dioxin, Polychlorinated Dibenzofurans, Human Exposure, Samples, PCDDs, PCDFs, Contamination, Food, Incineration, Patterns

Torres-Sánchez, L.E., Berkowitz, G., López-Carrillo, L., Torres-Arreola, L., Ríos, C. and López-Cervantes, R. (1999), Intrauterine lead exposure and preterm birth. *Environmental Research*, **81** (4), 297-301.

Full Text: [E\Env Res81, 297.pdf](E/Env%20Res81,%20297.pdf)

Abstract: The objective of this study was to determine the risk of preterm birth in relation to umbilical cord blood lead levels (UCL) among primiparous and multiparous women. A case-cohort study was performed in Mexico City during 1995. A total of 459 full-term births was compared with 161 preterm births (before 37 gestational weeks). Mothers were interviewed before the delivery about their reproductive histories and other related factors of preterm birth. Lead was determined by atomic absorption spectrophotometry. Lead levels were higher in primiparous women who had a preterm birth than in primiparous women with a fullterm birth (9.77±2.0 µg/dl vs 8.24±2.15 µg/dl), this difference was marginally significant. After adjusting for other known preterm birth risk factors, the frequency of preterm birth was almost three times higher among women who had UCL levels greater or equal to 5.1 µg/dl compared to those who had UCL levels lower than 5.1 µg/dl. This difference was not observed among multiparous women. Our results suggest that intrauterine lead exposure may be associated with preterm birth in first deliveries but not in subsequent ones. (C) 1999 Academic Press.

Keywords: Lead, Preterm Birth, Epidemiology, Mexico, Parity, Blood Lead, Pregnancy, Mobilization, Weight, Bone, Determinants, Women

Yang, C.Y., Chiu, H.F., Cheng, M.F., Tsai, S.S., Hung, C.F. and Lin, M.C. (1999), Esophageal cancer mortality and total hardness levels in Taiwan’s drinking water. *Environmental Research*, **81** (4), 302-308.

Full Text: [E\Env Res81, 302.pdf](E/Env%20Res81,%20302.pdf)

Abstract: The possible association between the risk of esophageal cancer and hardness levels in drinking water from municipal supplies was investigated in a matched case-control study in Taiwan. All eligible esophageal cancer deaths (2084 cases) of Taiwan residents from 1987 through 1996 were compared with deaths from other causes (2084 controls), and the hardness levels of the drinking water used by these residents were determined. Data on water hardness throughout Taiwan have been collected from the Taiwan Water Supply Corporation (TWSC). 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. The results show that there is a 42% excess risk of mortality from esophageal cancer in relation to the use of soft water (adjusted odds ratio and 95% confidence intervals was 1.42 (1.22-1.66). This is an important finding for the Taiwan water industry and human health. Copyright 1999 Academic Press.

Keywords: Nonsteroidal Antiinflammatory Drugs, Risk-Factors, Cardiovascular Mortality, Gastric-Cancer, Colon-Cancer, Magnesium, Adenocarcinomas, Experience, Industry, Calcium

Taha, T., Kanarek, M.S., Schultz, B.D. and Murphy, A. (1999), Low-cost household paint abatement to reduce children’s blood lead levels. *Environmental Research*, **81** (4), 334-338.

Full Text: [E\Env Res81, 334.pdf](E/Env%20Res81,%20334.pdf)

Abstract: The purpose was to examine the effectiveness of low-cost abatement on children’s blood lead levels. Blood lead was analyzed before and after abatement in 37 homes of children under 7 years old with initial blood lead levels of 25-44 µg/dL. Ninety-five percent of homes were built before 1950. Abatement methods used were wet-scraping and repainting deteriorated surfaces and wrapping window wells with aluminum or vinyl. A control group was retrospectively selected. Control children were under 7 years old, had initial blood lead levels of 25-44 µg/dL and a follow-up level at least 28 days afterward, and did not have abatements performed in their homes between blood lead levels. After abatement, statistically significant declines occurred in the intervention children’s blood lead levels. The mean decline was 22%, 1 to 6 months after treatment. After adjustment for seasonality and child’s age, the mean decline was 6.0 µg/dL, or 18%. The control children’s blood levels did not decline significantly. There was a mean decline of 0.25 µg/dL, or 0.39%. After adjustment for seasonality and age, the mean decline for control children was 1.6 µg/dL, or 1.8%. Low-cost abatement and education are effective short-term interim controls. (C) 1999 Academic Press.

Keywords: Lead Poisoning, Lead Abatement, Risk Reduction, Children, Low-Cost Lead Hazard Control, Health

Stewart, P., Pagano, J., Sargent, D., Darvill, T., Lonky, E. and Reihman, J. (2000), Effects of Great Lakes fish consumption on brain PCB pattern, concentration, and progressive-ratio performance. *Environmental Research*, **82** (1), 18-32.

Full Text: [E\Env Res82, 18.pdf](E/Env%20Res82,%2018.pdf)

Abstract: This study investigated the effects of consumption of Great Lakes fish on progressive ratio performance, and on the pattern and concentrations of brain polychlorinated biphenyls (PCBs), dichlorodiphenyldichloroethene (DDE), and mirex in the rat. Adult, male Sprague-Dawley rats were fed a 30% diet of either Lake Ontario salmon (LAKE), Pacific Ocean salmon, or lab chow control for 20 or 65 days. Following the treatment regimen, half the rats from each group were sacrificed immediately for gas chromatographic analysis of organochlorine contaminants, and the other half were tested on a multiple fixed-ratio-progressive-ratio reinforcement schedule and then sacrificed for analysis. Consumption of Lake Ontario fish resulted in significantly higher levels of brain PCBs, DDE, and mirex relative to controls, but still web within human exposure ranges (<1 µg/g fat). Consumption of Lake Ontario fish for 20 or 65 days produced an average brain PCB concentration of 457 and 934 ng/g fat, respectively. Consumption of laboratory rat chow or Pacific Ocean salmon for 20 or 65 days produced an average brain PCB concentration of 240, 464, and 441 ng/g fat, respectively. Moreover, both LAKE-fed groups showed a much more heavily chlorinated pattern of brain PCBs than all control groups, as evidenced by both significant increases in the most heavily chlorinated PCB congeners and significant increases in the average chlorine biphenyl. All LAKE brains contained significant concentrations of DDE and mirex, whereas no control brains contained any detectable quantities. Analysis of progressive-ratio performance indicated that LAKE rats responded normally during fixed-ratio schedules but quit significantly sooner than control rats on a progressive-ratio 5 (PR5) schedule, indicating reduced persistence on progressively leaner reinforcement schedules. Analysis of brain PCBs indicated that total PCBs were most strongly related to PR5 performance. These data indicate that consumption by rats of contaminated Lake Ontario fish produces (1) increased concentrations of PCBs, DDE, and mires in the brain, (2) a more heavily chlorinated distribution of PCBs in the brain, and (3) reduced persistence of progressive-ratio reinforcement schedules. While these behavioral changes are related to brain PCB level, more work is necessary before the effects can be directly attributed to PCBs. (C) 2000 Academic Press.

Keywords: Polychlorinated Biphenyls, Dichlorodiphenyldichloroethene, Mirex, Great Lakes Fish, Rats, Polychlorinated-Biphenyls, Ontario Salmon, Dichlorodiphenyl Dichloroethene, Organochlorine Residues, Maternal Consumption, Adipose-Tissue, Chinook Salmon, Human-Milk, in-Utero, Exposure

Tristán, E., Demetriades, A., Ramsey, M.H., Rosenbaum, M.S., Stavrakis, P., Thornton, I., Vassiliades, E. and Vergou, K. (2000), Spatially resolved hazard and exposure assessments: An example of lead in soil at Lavrion, Greece. *Environmental Research*, **82** (1), 33-45.

Full Text: [E\Env Res82, 33.pdf](E/Env%20Res82,%2033.pdf)

Abstract: Spatially resolved hazard assessment (SRHA) and spatially resolved exposure assessment (SREA) are methodologies that have been devised for assessing child exposure to soil containing environmental pollutants. These are based on either a quantitative or a semiquantitative approach. The feasibility of the methodologies has been demonstrated in a study assessing child exposure to Pb accessible in soil at the town of Lavrion in Greece. Using a quantitative approach, both measured and kriged concentrations of Pb in soil are compared with an “established” statutory threshold value. The probabilistic approach gives a refined classification of the contaminated land, since it takes into consideration the uncertainty in both the actual measurement and estimated kriged values. Two exposure assessment models (i.e., IEUBK and HESP) are used as the basis of the quantitative SREA methodologies. The significant correlation between the blood-Pb predictions, using the IEUBK model, and measured concentrations provides a partial validation of the method, because it allows for the uncertainty in the measurements and the lack of some site-specific measurements. The semiquantitative applications of SRHA and SREA incorporate both qualitative information (e.g., land use and dustiness of waste) and quantitative information (e.g., distance from wastes and distance from industry). The significant correlation between the results of these assessments and the measured blood-Pb levels confirms the robust nature of this approach. Successful application of these methodologies could reduce the cost of the assessment and allow areas to be prioritized for further investigation, remediation, or risk management. (C) 2000 Academic Press.

Keywords: Exposure Assessment, Hazard, Exposure, Lead, Metals, Sequential Extraction

Shinn, N.J., Bing-Canar, J., Cailas, M., Peneff, N. and Binns, H.J. (2000), Determination of spatial continuity of soil lead levels in an urban residential neighborhood. *Environmental Research*, **82** (1), 46-52.

Full Text: [E\Env Res82, 46.pdf](E/Env%20Res82,%2046.pdf)

Abstract: This study uses geostatistical techniques to model and estimate soil lead levels in an urban, residential neighborhood. Sixty-two composite soil samples (median 1773 ppm, range 175 to 7953 ppm) in a four-block area of brick and stone homes were obtained. The spatial continuity of soil lead levels was modeled with a semi-variogram, which was then used to estimate lead levels at unsampled locations, a process called kriging. Because soil lead levels were spatially correlated, it is likely that a “nonrandom” process generated the lead distribution found. This finding signifies the existence of lead sources which were tentatively identified on historical maps of the area and from past traffic volume patterns. The distribution of kriged estimates of soil lead levels provides an explanatory tool for exploring and identifying potential sources and mag be useful for targeting urban soil abatement efforts. (C) 2000 Academic Press.

Keywords: Soil, Lead, Mapping, Geostatistics, Urban, Blood Lead, Children, Smelter, Exposure, Plants

Nilsson, U., Schütz, A., Bensryd, I., Nilsson, A., Skerfving, S. and Mattsson, S. (2000), Cadmium levels in kidney cortex in Swedish farmers. *Environmental Research*, **82** (1), 53-59.

Full Text: [E\Env Res82, 53.pdf](E/Env%20Res82,%2053.pdf)

Abstract: The cadmium levels in kidney cortex (K-Cd) did not differ statistically between 10 nonsmoking farmers from the south of Sweden, who had a high intake of locally produced food and who were affected by acid precipitation (as indicated by low pH in the drinking water from their private wells) and 10 farmers less affected (medians: K-Cd, 18 vs 14 µg/g, water pH, 5.2 vs 7.8). Neither did 10 farmers selected because of “high” blood cadmium (E-Cd) differ from 10 with “low” [medians: H-Cd, 15 vs 9 µg/g, B-Cd, 2.6 vs 1.3 nmol/L (0.29 vs 0.14 µg/L)]. In all 40 farmers, there was an increase of urinary cadmium levels (U-Cd) with decreasing drinking water pH (r(s) = -0.32, P = 0.045). Further, K-Cd increased with rising B-Cd (r(s) = 0.33, P = 0.037), and both B-Cd (r(s) = 0.73, P = 0.0005), and U-Cd (r(s) = 0.74, P = 0.0005) rose with increasing age. Further, there was an association between U-Cd and B-Cd (r(s) = 0.68, P = 0.0005). We could not demonstrate with certainty any effect of the acid precipitation on the cadmium retention in the farmers, although the association between U-Cd and drinking water pH deserves further study. (C) 2000 Academic Press.

Keywords: Cadmium, Kidney, Blood, Urine, Acid Precipitation, Ray-Fluorescence Analysis, Biological Half-Time, Measured Invivo, Exposure, Population, Workers

Manton, W.I., Angle, C.R., Stanek, K.L., Reese, Y.R. and Kuehnemann, T.J. (2000), Acquisition and retention of lead by young children. *Environmental Research*, **82** (1), 60-80.

Full Text: [E\Env Res82, 60.pdf](E/Env%20Res82,%2060.pdf)

Abstract: The concentrations and isotope ratios of lead in blood and urine, on the hands, and in duplicate diet samples were measured for children living in Omaha, Nebraska. One group consisted of 22 children followed from birth to between 1 and 2 years of age and another group was 20 2- to 4-year-old children followed for 1 year, although some in each group were followed for periods between 3 and 4 years, At no time in Life was a component of dietary lead identified in blood by isotope ratios, and blood lead appears dominated by lead derived from the hands, which in turn appears derived from the floors. For some homes floor lead appeared to be a mixture of lead from window sills and from the exterior. Only 2 of the children appear to have ingested lead directly from window sills. Several who lived in homes being remodeled were exposed to lead before the age of 2 years. For those who had been briefly exposed during professional remodeling the blood lead fell with a half-Life of 10 months but for those who had suffered prolonged exposure during remodeling by parents the apparent half-life was longer, between 20 and 38 months. (C) 2000 Academic Press.

Keywords: Physiologically-Based Models, Contaminated House-Dust, Bone-Seeking Elements, Blood Lead, Environmental Lead, Exposure, Absorption, Humans, Soil, Identification

Rothenberg, S.J., Khan, F., Manalo, M., Jiang, J.A., Cuellar, R., Reyes, S., Acosta, S., Jauregui, M., Diaz, M., Sanchez, M., Todd, A.C. and Johnson, C. (2000), Maternal bone lead contribution to blood lead during and after pregnancy. *Environmental Research*, **82** (1), 81-90.

Full Text: [E\Env Res82, 81.pdf](E/Env%20Res82,%2081.pdf)

Abstract: We examined bone lead contribution to blood lead in a group of 311 immigrant women, 99% from Latin America, during the third trimester of pregnancy and 1 to 2 months after delivery. We measured in vivo tibia and calcaneus (heel) bone lead concentration in the postdelivery period with K shell X-ray fluorescence. Prenatal and postnatal geometric mean (range) blood lead level was 2.2 µg/dL (0.4 to 38.7) and 2.8 µg/dL (0.4 to 25.4), reflecting low current exposure. Postnatal blood lead level was significantly higher than prenatal (P < 0.0001). Mean (range) tibia and calcaneus lead concentration was 6.7 µg/g (-33.7 to 62.2) and 8.4 µg/g (-30.1 to 66.4), reflecting varying but elevated past lead exposure. Mean calcaneus lead concentration was significantly higher than mean tibia lead concentration (P = 0.055). Variance-weighted multiple regression and structural equation models showed that both calcaneus and tibia lead were directly associated with prenatal blood lead but only calcaneus lead was associated with postnatal blood lead. Increasing natural log years in the United States independently predicted decreasing calcaneus and third-trimester blood lead. The data suggest that while some exogenous lead sources and modulators of blood lead level, such as use of lead-glazed pottery and calcium in the diet, control lead exposure during and after pregnancy, endogenous lead sources from past exposure before immigration continue to influence blood lead levels in this sample. (C) 2000 Academic Press.

Keywords: Blood Lead, Bone Lead, Pregnancy, Calcium, Latina, X-Ray-Fluorescence, Mexico-City, Women, Mobilization, Determinants, Increases, Skeleton, Exposure, Men

Burke, T.A., Litt, J.S. and Fox, M.A. (2000), Linking public health and the health of the Chesapeake Bay. *Environmental Research*, **82** (2), 143-149.

Full Text: [E\Env Res82, 143.pdf](E/Env%20Res82,%20143.pdf)

Abstract: The Chesapeake Bay has a profound impact on the lives of all who reside in the 64,000 square miles of its watershed. From crab cakes to sailboats, drinking water to naval ships, the Bay touches virtually every aspect of life in the region. The Bay has inspired literature, driven the regional economy, and shaped political decision making and development patterns for homes, industry, agriculture, and transportation. As population demands increase and urban boundaries expand into pristine landscapes, the sustainability of the Chesapeake Bay and its resources face unprecedented pressures. Consequently, the public’s health also is vulnerable to Bay pollution and other stresses stemming from development activities and widespread growth occurring throughout the Chesapeake Bay watershed. This paper will examine the linkages between the environmental quality of the Bay and the population health status, recommend ways to bridge ecological and human health concerns in the context of the Bay, and finally present a framework for developing a *Public Health Rep*ort card for the Bay. (C) 2000 Academic Press.

Yang, C.Y., Cheng, M.F., Tsai, S.S. and Hung, C.F. (2000), Fluoride in drinking water and cancer mortality in Taiwan. *Environmental Research*, **82** (3), 189-193.

Full Text: [E\Env Res82, 189.pdf](E/Env%20Res82,%20189.pdf)

Abstract: The possibility that cancer risk is associated with naturally fluoridated water in Taiwan is examined. The 1982-1991 age-adjusted mortality rates for cancer for 10 municipalities whose water supplies contained the highest naturally occurring fluoride concentrations in Taiwan were compared to those rates for 10 matched municipalities with unfluoridated water. The two groups had similar urbanization levels and sociodemographic characteristics. Our study does not support the suggestion that fluoridation of water supplies is associated with an increase in cancer mortality in Taiwan. Copyright 2000 Academic Press.

Keywords: Fluoridation, Drinking Water, Cancer, Mortality, Epidemiology, Supplies

Suplido, M.L. and Ong, C.N. (2000), Lead exposure among small-scale battery recyclers, automobile radiator mechanics, and their children in Manila, the Philippines. *Environmental Research*, **82** (3), 231-238.

Full Text: [E\Env Res82, 231.pdf](E/Env%20Res82,%20231.pdf)

Abstract: Blood lead (PbB) and hemoglobin levels (Hb) were determined in 40 battery repair/recycling shop workers, 16 radiator repair shop workers, and 20 children living in the immediate vicinity of these shops. Unexposed residents with similar socioeconomic status were also investigated. Mean PbB level was significantly higher for battery workers (54.23 µg/dL) when compared to radiator workers (20.04 µg/dL) and unexposed adults (12.56 µg/dL) (P<0.001). Among battery workers, 94% had PbB levels above the WHO permissible exposure limit of 40 µg/dL for males and 30 µg/dL for females. There was no demarcation between workplace and living quarters, therefore, workers’ families were similarly exposed to hazards. Children living in the immediate vicinity of battery shops also had significantly higher mean PbB levels (49.88 µg/dL) compared to radiator shop children (11.84 µg/dL) and unexposed children (9.92 µg/dL). For workers with PbB > 40 µg/dL, 90% were anemic (Hb < 13 g/dL for males and < 11.5 g/dL for females). Linear regression showed a correlation (r = -0.214, P = 0.03) between Hb level and log(10)PbB. There was no significant relationship between anemia and blood lead in children (r = -0.146). We conclude that radiator repair activities appeared to increase the body burden of lead, although not up to a level significantly different from unexposed counterparts. Battery recycling/repair activities, however, significantly increased blood lead levels in workers and their children. (C) 2000 Academic Press.

Keywords: Repair Workers, Blood, Jamaica, City

Wu, P.C., Su, H.J. and Ho, H.M. (2000), A comparison of sampling media for environmental viable fungi collected in a hospital environment. *Environmental Research*, **82** (3), 253-257.

Full Text: [E\Env Res82, 253.pdf](E/Env%20Res82,%20253.pdf)

Abstract: Quantitative evaluation of fungal exposure is often conducted by analysis of the composition of microbes in air samples and calculation of the concentrations afterward. The collecting medium that favors the growth for most saprophytic fungi is considered to be the ideal choice in most circumstances. Currently, the culture medium most frequently adopted in environmental sampling for airborne fungi is MEA (malt extract agar) recommended by the ACGIH for its suitability for most fungal growth. DG18 (dichloran glycerol-18), developed in 1980, is suggested for growth at lower water activity (a (w) = 0.95) specifically and is not as commonly used in general studies. This investigation collected airborne viable fungi using a single stage/N6 Andersen impactor with MEA and DG18 agar plates attached simultaneously to the same set of samplers. The sampling locations were at 17 sites within a central air-conditioned hospital. After incubation and morphological identification, concentrations of airborne fungi and bacteria were expressed as, C.F., U/m3 (colony forming units/m3). There are 405 DG18 plates and 378 plates available for statistical analysis. Results show that the airborne fungal concentrations, shown by geometric mean (GM), are higher from the DG18 plates than from the MEA plates. The total fungal concentrations is 68.6 vs 12.94, C.F., U/m3, and for *Aspergillus* spp., the concentration is 1.58 vs 0.72, C.F., U/m3, for *Penicillium* spp., 3.37 vs 0.71, and for yeast, 5.09 vs 0.49, C.F., U/m (3). In addition, the number of different genera present is greater on the DG18 plates than on the MEA plates, on average, 2.85 types vs 1.72. This study suggests that in a hospital environment with 24-h, central air conditioning, DG18 plates appear to be more effective in collecting more fungal colonies in terms of both quantity and types of genera. Such a finding is presumed to be attributed to the characteristic of DG18 in slowing colony growth so that the dominating genus will not over occupy the culture plate surface before the less competitive genus can fully develop. Future studies on related biological mechanisms are essential to conclude whether the above results sustain when sampling is conducted in other environments. Copyright 2000 Academic Press.

Graczyk, T.K., Evans, B.M., Shiff, C.J., Karreman, H.J. and Patz, J.A. (2000), Environmental and geographical factors contributing to watershed contamination with *Cryptosporidium parvum* oocysts. *Environmental Research*, **82** (3), 263-271.

Full Text: [E\Env Res82, 263.pdf](E/Env%20Res82,%20263.pdf)

Abstract: *Cryptosporidium parvum* is a waterborne parasite which infects cattle and produces life-threatening zoonosis in people with impaired immune systems. Digital maps of 100-year floodplain boundaries, land use/cover, and livestock operations were used to select and characterize cattle farms in the floodplain area in Lancaster County, Pennsylvania, U.S.A. Over 21% of the cattle farms were located within 100-year floodplain boundaries. On average, a single farm comprised 12.8 ha of pasture (including buildings and farmyard) at risk of inundation. In all farms cattle had unlimited access to the creek. Manure samples collected from closed-in calf pens, cow/heifer yard runoff, and cattle paths through the creek were tested for *C. parvum*. On 64% of the farms (n = 50) at least one sample was positive for *C. parvum*, and 44% of the farms had oocysts in all manure samples. Concentration varied from 90 to 371 oocysts/g and was significantly higher (P<0.02) in calf samples than in manure from cow and cow/heifer. Copyright 2000 Academic Press.

Keywords: *Giardia*, Manure, Transmission, Infectivity, Quality, Calves, Cattle, Model, Herds, Cows, Watershed, *Cryptosporidium parvum*, Cattle Farms, Waterborne Oocysts, Contamination

Wittsiepe, J., Schrey, P., Ewers, U., Wilhelm, M. and Selenka, F. (2000), Decrease of PCDD/F levels in human blood: Trend analysis for the German population, 1991-1996. *Environmental Research*, **83** (1), 46-53.

Full Text: [E\Env Res83, 46.pdf](E/Env%20Res83,%2046.pdf)

Abstract: More than 500 whole blood samples of normal subjects from Germany collected in 1991-1996 have been analyzed for polychlorinated dibenzo-p-dioxins (PCDD) and dibenzofurans (PCDF) by capillary gas chromatography/high-resolution mass spectrometry. Over the examined time period a continuous decrease of the PCDD/F concentrations in human blood was observed. The mean levels found were about 42.7 pg I-TEq/g (lipid basis) in 1991 and 20.7 pg I-TEq/g (liquid basis) in 1996 {median: 40.8 and 19.2}. A reduction to about half was found for most congeners. Each 1-year subset of the, entire collective shows a positive correlation of the PCDD/F blood levels with age for most of the congeners, the sum values, and the calculated toxicity equivalents. For statistical evaluation a multiplicative model was used: Concentration in blood = A.age(B). The correlation is mostly pronounced for lower chlorinated PCDD and for 2, 3, 4, 7, 8-PentaCDF. (C) 2000 Academic Press.

Keywords: Polychlorinated Dibenzo-p-Dioxins, Polychlorinated Dibenzofurans, PCDD, PCDF, TCDD, Germany, Human Blood, Biological Monitoring, Background Data, PCDFs

Paumgartten, F.J.R., Cruz, C.M., Chahoud, I., Palavinskas, R. and Mathar, W. (2000), PCDDs, PCDFs, PCBs, and other organochlorine compounds in human milk from Rio de Janeiro, Brazil. *Environmental Research*, **83** (3), 293-297.

Full Text: [E\Env Res83, 293.pdf](E/Env%20Res83,%20293.pdf)

Abstract: The levels of polychlorinated dibenzo-p-dioxins (PCDDs) and -furans (PCDFs), polychlorinated biphenyls (PCBs), and other organochlorine compounds were determined in a pooled sample of breast milk from 40 mothers (first lactation: 33, second lactation: 7, age: 15 38 years) living in the urban area of Rio de Janeiro County, Brazil, in 1992. Mothers were breast-feeding only one infant and milk was collected between 4 and 6 weeks after delivery. The results showed a dioxin equivalent concentration of 8.1 pg I-TEq/g milk fat. The levels of other chlorinated compounds (micrograms per gram of milk fat) were as follows: PCBs (total), 0.15, alpha-HCH, 0.001, beta-HCH, 0.27,gamma-HCH, 0.005, HCB, 0.012, DDT (total), 1.7, dieldrin, 0.023, and cis-heptachhlor epoxide, 0.008. These results suggest that human background contamination by PCDD/Fs, PCBs, and HCB in Rio de Janeiro is lower than that generally found in industrialized countries. (C), 2000 Academic Press.

Keywords: Dioxins, Breast Milk, TCDD, South America, Human Exposure, Polychlorinated Dibenzofurans, Human Tissue, Dioxins, Exposure, Populations, Germany, Samples

Sharma, K. and Reutergardh, L.B. (2000), Exposure of preschoolers to lead in the Makati area of Metro Manila, the Philippines. *Environmental Research*, **83** (3), 322-332.

Full Text: [E\Env Res83, 322.pdf](E/Env%20Res83,%20322.pdf)

Abstract: A study was conducted in the Makati area of Metro Manila, the Philippines. The study evaluated the significance of playground soil lead intake to the total daily lead burden in preschool children. The lead concentration was measured in residential playground soils, food, water, and hair samples by atomic absorption spectrometer and the data we: re used to draw conclusions. All of the playground soils were contaminated with lead levels ranging from a minimum of 34.54 µg/g to a maximum of 283.13 µg/g in comparison to the naturally occurring lead level of 15 µg/g in soils. Further, the study conducted a lead analysis on the hair of the study population to determine the accumulated lead intake. Ingestion of 25 mg/day of soil contributed to 4% of the total lead intake per day by children exposed to the study sites. Food (83%) was found to be the major source of lead compared to other sources. The study also includes economic valuation and cost benefit analysis from reducing lead in gasoline. (C) 2000 Academic Press.

Keywords: Environment, Lead, Philippines, Vehicle Preschoolers, Blood, Abatement

Needleman, H.L. (2001), The removal of lead from gasoline: Historical and personal reflections. *Environmental Research*, **84** (1), 20-35.

Full Text: [E\Env Res84, 20.pdf](E/Env%20Res84,%2020.pdf)

Abstract: Tetraethyllead (TEL) was first fabricated for use in gasoline in 1923. Shortly after manufacture began, workers at all three plants began to become floridly psychotic and die. A moratorium on TEL production was put into place, but was Lifted in 1926. Between 1926 and 1965, the prevailing consensus was that lead toxicity occurred only at high levels of exposure and that lead in the atmosphere was harmless. Most of the data on lead toxicity issued from a single source, the Kettering Laboratory in Cincinnati. In 1959, the first warnings of adverse health effects of lead at silent doses were raised by Clair Patterson, a geochemist. In hearings before the Senate Committee on Public Works, Senator Edward Muskie raised the question of adverse health effects from airborne lead. As new data accumulated on health effects of lead at lower doses, the movement to remove lead from gasoline gained momentum, and the Environmental Protection Agency examined the question. The removal of lead mould take place over the next 25 years, and its accomplishment would require a severe change in the federal stance regarding its hazard. This article details the interaction of various forces, industrial, regulatory, judicial, public health, and public interest, that mere engaged in this contest and estimates the value of this step. (C) 2000 Academic Press.

Keywords: Blood

Calderon, J., Navarro, M.E., Jimenez-Capdeville, M.E., Santos-Diaz, M.A., Golden, A., Rodriguez-Levya, I., Borja-Aburto, V. and Diaz-Barriga, F. (2001), Exposure to arsenic and lead and neuropsychological development in Mexican children. *Environmental Research*, **85** (2), 69-76.

Full Text: [E\Env Res85, 69.pdf](E/Env%20Res85,%2069.pdf)

Abstract: This cross-sectional study examined the effects of chronic exposure to lead (Pb), arsenic (AS) and undernutrition on the neuropsychological development of children. Two populations chronically exposed to either high (41 children) or low (39 children) levels of As and Pb were analyzed using the Wechsler Intelligence Scale for Children, Revised Version, for Mexico (WISC-RM). Geometric means of urinary arsenic (AsU) and lead in blood (PbB) were 62.9±0.03 (µgAs/g creatinine) and 8.9±0.03 (µg/dl) for the exposed group and 40.2±0.03 (µgAs/g creatinine) and 9.7±0.02 (µg/dl) for the reference group. The height for age index (HAI) was used as an indicator of chronic malnutrition and sociodemographic information was obtained with a questionnaire. Lead and arsenic were measured by atomic absorption spectrophotometry. Data on full, verbal, and performance intelligence quotients (IQ) scores, long-term memory, linguistic abstraction, attention span, and visuospatial organization were obtained through the WISC-RM. After controlling for significant potential confounders verbal IQ (P < 0.01) decreased with increasing concentrations of AsU. The HAI correlated positively with full-scale and performance IQ (P < 0.01). Higher levels of AsU were significantly related to poorer performance on WISC-RM factors examining long-term memory and linguistic abstraction, while lower scores in WISC-RM factors measuring attention were obtained at increasing values of PbB. Our results suggest that exposure to As and chronic malnutrition could have an influence on verbal abilities and long-term memory, while Pb exposure could affect the attention process even at low levels. (C) 2001 Academic Press.

Keywords: Arsenic, Lead, Malnutrition, Neuropsychological Development, IQ, Attention, International Growth Reference, Port-Pirie Cohort, Cognitive Function, Iron-Deficiency, Level, Intelligence, Indicators, Cadmium, Infants

Hsu, C.H., Jeng, W.L., Chang, R.M., Chien, L.C. and Han, B.C. (2001), Estimation of potential lifetime cancer risks for trihalomethanes from consuming chlorinated drinking water in Taiwan. *Environmental Research*, **85** (2), 77-82.

Full Text: [E\Env Res85, 77.pdf](E/Env%20Res85,%2077.pdf)

Abstract: Data on concentrations of trihalomethanes (THMs) in raw and chlorinated water collected from three water treatment plants in Taiwan and estimates of the lifetime cancer risk for THMs from drinking water, using age-adjusted factors and volatilization terms, are presented. Data on THM levels in drinking water were obtained from the annual reports of the Environmental Protection Administration (EPA) of Taiwan. The methodology for estimation of lifetime cancer risks was taken from the USEPA. Chloroform was the major species of THMs, especially in the water plant of south Taiwan. Chloroform contributed the majority of the lifetime cancer risks (range: 87.5-92.5%) of total risks from the three water supply areas. All lifetime cancer risks for CHCl3, CHBrCl2, CHBr2Cl, and CHBr3 from consuming tap water in the three water supply areas were higher than 10-6. The sum of lifetime cancer risks for CHCl3, CHBrCl2, CHBr2Cl, and CHBr3 was highest (total risk for total THMs < 1.94×10-4) for tap water from south Taiwan. (C) 2000 Academic Press.

Keywords: Trihalomethanes, Exposure, Cancer Risks, Taiwan, Drinking Water, By-Products, Bladder-Cancer, Chloroform, Association, Mortality, Exposure, Iowa

Shen, X.M., Wu, S.H., Yan, C.H., Zhao, W., Ao, L.M., Zhang, Y.W., He, J.M., Ying, J.M., Li, R.Q., Wu, S.M. and Guo, D. (2001), Delta-aminolevulinate dehydratase polymorphism and blood lead levels in Chinese children. *Environmental Research*, **85** (3), 185-190.

Full Text: [E\Env Res85, 185.pdf](E/Env%20Res85,%20185.pdf)

Abstract: This study investigated the relationship between the delta-aminolevulinate dehydratase (ALAD) isozymes and the blood lead levels of Chinese children. The purpose of this study was to determine the precise ALAD genotyping in Chinese children and identify the contribution of the ALAD genotype to the body lead burden. Blood samples were obtained from 109 boys and 120 girls. These children were 6-10 years old and from a single primary school. Both the school and their homes were within a community in which a large smelter was located. An environmental questionnaire was obtained for each subject, and blood lead levels and ALAD isozyme phenotype were analyzed in a double-blinded fashion. The blood lead levels of 229 children ranged from 4.5 to 26.4 µg /dl, the mean was 10.3 µg /dl and the standard deviation was 3.3 µg/dl. The gene distribution of the ALAD isozyme phenotypes in these environmentally exposed children was ALAD 1-1 (92%), ALAD 1-2, (8%), and ALAD 2-2 (0%). The mean blood level of the environmentally exposed children, who were homozygous for the ALAD(1) allele, was 9.7 µg/dl, the mean for those who were heterozygous for the ALAD(2) allele was 11.7 µg/dl. Using the t test, the means of the groups were different at the level of t = 2.2058, P < 0.05. Stepwise regression and multiple analyses of covariance were employed to control the confounders to measuring the independent contribution of the ALAD genotype on blood lead levels. After controlling the confounders, the contribution of the ALAD genotype to the blood lead level was greater and still statistically significant (F = 7.3201, P < 0.01). These results indicate that individuals carrying the ALAD(2) allele are more likely to have sustained increases in blood lead levels when exposed to a lead-contaminated environment. (C) 2001 Academic Press.

Keywords: Acid Dehydratase, Genetic-Polymorphism, Workers, Isozymes

Yang, C.Y., Chang, W.T., Chuang, H.Y., Tsai, S.S., Wu, T.N. and Sung, F.C. (2001), Adverse health effects among household waste collectors in Taiwan. *Environmental Research*, **85** (3), 195-199.

Full Text: [E\Env Res85, 195.pdf](E/Env%20Res85,%20195.pdf)

Abstract: Household waste collectors (HWCs) are potentially exposed to a variety of bioaerosols and toxic materials. Collection of household waste is also a job which requires repeated heavy physical activity such as lifting, carrying, pulling, and pushing. The object of this study was to assess whether there is an excess of adverse health outcomes among HWCs. The subjects were all current employees of the Household Waste Collection Department in the County of Kaohsiung, Taiwan. The survey questionnaire was completed by 533 HWCs and 320 office workers. Our data indicate that household waste collection presents a risk for the development of chronic respiratory symptoms (cough, phlegm, wheezing, and chronic bronchitis), musculoskeletal symptoms (low back pain and elbow/wrist pain), and injuries caused by sharp objects. (C) 2001 Academic Press.

Keywords: Household Waste Collectors, Musculoskeletal Complaints, Respiratory Symptoms, Occupational Epidemiology, Water-Treatment Workers, Domestic Waste, Exposure, Equipment, Symptoms, Sewage

Aoki, Y. (2001), Polychlorinated biphenyls, polychloronated dibenzo-p-dioxins, and polychlorinated dibenzofurans as endocrine disrupters: What we have learned from Yusho disease. *Environmental Research*, **86** (1), 2-11.

Full Text: [E\Env Res86, 2.pdf](E/Env%20Res86,%202.pdf)

Abstract: Polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins, and polychlorinated dibenzofurans (PCDFs) are persistent environmental pollutants. In some areas wildlife reproduction has been affected by these compounds, which are recognized as endocrine disrupters. In 1968 in northern Kyushu in Japan about 2000 people were poisoned by PCBs and PCDFs (pyrolysis products of PCBs) which contaminated rice oil. Their condition was named “Yusho” disease. A similar poisoning by PCBs in Taiwan was named “Yu-Cheng” disease. The major symptoms of Yusho disease were dermal and ocular lesions, but some of the symptoms, such as irregular menstrual cycles and altered immune responses, were notable with respect to the endocrine disrupting activities of PCBs and related compounds. Several important observations relevant to the mechanisms of Yusho have been made from animal studies. For example, a coplanar PCB congener was shown to cause atrophy of the thymus and PCB administration was thought to alter androgen metabolism. The most tragic aspect of Yusho and Yu-Cheng diseases was the exposure of children to PCBs. In the case of Yu-Cheng, children exposed to PCBs in utero and lactationally were reported to have poor cognitive development. Intellectual impairment was also observed in children born to women who had eaten fish contaminated with PCBs in the United States. From animal studies, alterations in thyroid hormone status, modulation of protein kinase C, and changes in dopamine levels, etc, were proposed as the possible mechanisms for the adverse effects of PCBs on brain development. Whereas coplanar PCB and related congeners, e.g, 2,3,7,8-tetrachlorodibenzo-p-dioxin, induce gene expression via a ligand-dependent transactivating factor, the arylhydrocarbon receptor, alternative pathways for gene expression, e.g., c-Src and cross talk with the MAP kinase pathway, are also reviewed with respect to understanding the toxic mechanisms of these compounds. Finally, the “precautionary principle” is discussed for prevention of the health hazards caused by exposure to endocrine disrupters. (C) 2001 Academic Press.

Keywords: Polychlorinated Biphenyl, 2,3,7,8-Tetrachlorodibenzo-p-Dioxin, Yusho, Endocrine Disrupter, Protein Kinase, Yu-Cheng Patients, Protein-Phosphorylation Pathway, Growth-Factor Receptor, Female B6C3F1 Mice, 2,3,7,8-Tetrachlorodibenzo-p-Dioxin TCDD, AH Receptor, Adult-Rats, In-Utero, Tyrosine Phosphorylation, Subchronic Exposure

Sweeney, A.M., Symanski, E., Burau, K.D., Kim, Y.J., Humphrey, H.E.B. and Smith, M.A. (2001), Changes in serum PBB and PCB levels over time among women of varying ages at exposure. *Environmental Research*, **86** (2), 128-139.

Full Text: [E\Env Res86, 128.pdf](E/Env%20Res86,%20128.pdf)

Abstract: The identification of host factors that are predictors of changes in serum polyhalogenated biphenyl contaminants over time has been a difficult challenge in epidemiologic studies of exposed individuals. of particular concern are age at exposure, reproductive and lactational histories, and changes in body mass index. Using both cross-sectional and longitudinal approaches, this study examined factors related to high initial serum PBB and PCB levels and changes in these levels over time among women of varying ages at exposure (n = 1772, age range < 1 to 45 years). In 1973, PBB exposure occurred through consumption of farm products contaminated with PBB added to cattle feed. Exposures to PCBs began in 1941 through PCB-contaminated silo sealant deteriorating into animal feed. The Michigan Department of Public Health began enrolling participants in 1977 and has continued to follow them through annual updates. At enrollment, questionnaires were administered to obtain demographic, lifestyle, and anthropometric measurements, medical/reproductive and occupational histories, and contaminated food consumption patterns. Blood samples were collected for PBB and PCB analysis at enrollment for all participants, additional serum tests were done on a subset of the population during follow-up. Median serum levels at enrollment were 2.0 ppb PBB and 5.0 ppb PCB. A decline in serum PBB level over an interval that ranged from 1 to 146 months (median = 31) was observed for 44.6% of the women (median = 1.0 ppb), while 12.2% showed an increase (median = 1.0 ppb). PCB levels declined in 50.3% of the women (median = 3.0 ppb) while 12.2% increased (median = 2.0 ppb). Relative to women whose contaminant levels were stable, higher initial serum level was a predictor of decline for both PBB and PCB (OR = 1.66, 95% CI 1.52-1.82, OR = 3.26, 95% CI 2.58-4.12, respectively), a yearly increase in interval between tests was related to declining PCBs (OR = 1.65, 95% CI 1.46-1.87). In addition, age less than or equal to 10 years at exposure (OR = 1.72, 95% CI 1.03-2.86) and residence on a quarantined farm (OR = 1.40, 95% CI 1.03-1.90) were predictors of a decrease in PBBs. Factors related to an increase in PBB levels were age less than or equal to 10 years at exposure (OR = 0.30, 95% CI 0.10-0.96) and initial PBB level (OR = 1.24, 95% CI 1.15-1.33), and for PCBs, high initial level (OR = 1.34, 95% CI 1.17-1.53) and body mass index (OR = 1.07, 95% CI 1.01-1.13). One or more live births during the interval between tests were not related to changing levels of either contaminant, breastfeeding data were not available for examination. Early age at exposure appears to be an important predictor of changes in serum PBB levels over time. (C) 2001 Academic Press.

Keywords: Polybrominated Biphenyls, Polychlorinated Biphenyls, Serum Levels, Exposure Assessment, Polychlorinated-Biphenyls PCBs, Polybrominated Biphenyls, Human-Milk, Cohort, DDE

Vieira, E.D.R., Torres, J.P.M. and Malm, O. (2001), DDTenvironmentalpersistence from its use in a vector control program: A case study. *Environmental Research*, **86** (2), 174-182.

Full Text: [E\Env Res86, 174.pdf](E/Env%20Res86,%20174.pdf)

Abstract: DDT contamination was investigated in soil, sediment, and chicken eggs from an endemic leishmaniasis area located in Rio de Janeiro City, Brazil. The last DDT application in this area was in 1990, for sand-fly vector control. Sampling campaigns were conducted in 1997 and 1999. DDT was extracted by use of a modified soxhlet apparatus and analysis was performed by gas chromatography with electron capture detector. The results show that, in 1997, soil samples contained up to 351 pg.kg-1 d.w. of Sigma DDT near the insecticide-sprayed sites. In 1999, the soil concentration decreased to 112 µg.kg-1 d.w. of Sigma DDT. Sediments from small creeks also showed low concentrations (up to 32.9 µg.kg-1 d.w. of Sigma DDT). Chicken eggs had, on average, 1.98 mg.kg-1 Sigma DDT (twice FAO’s maximum residue limit), comprising 82% of p, p’-DDE. Taking into account the egg results, DDT bioaccumulation is a question of concern. Considering just the egg consumption, it was estimated that DDT intake in the study area is 0.38×10-4 mg.kg-1 body weight.day-1 whereas the reference maximum dose (US EPA) is 5×10-4 mg.kg-1 body weight.day-1. This approach can be used to estimate DDT exposure in other places where DDT contamination may be of concern, especially in places where locally produced animals and eggs are a significant portion of the diet. (C) 2001 Academic Press.

Keywords: Ddt, Persistence, Soil, Bioaccumulation, Human Exposure, Human-Milk, Residues, Pesticides, Exposure, p, p’-DDE, Brazil, India

Glynn, A.W., Atuma, S., Aune, M., Darnerud, P.O. and Cnattingius, S. (2001), Polychlorinated biphenyl congeners as markers of toxic equivalents of polychlorinated biphenyls, dibenzo-p-dioxins and dibenzofurans in breast milk. *Environmental Research*, **86** (3), 217-228.

Full Text: [E\Env Res86, 217.pdf](E/Env%20Res86,%20217.pdf)

Abstract: In breast milk, concentrations of polychlorinated biphenyls (PCBs) are higher than those of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs), making PCB analyses less time-consuming and expensive. We searched for PCB “markers” of PCDD/DF concentrations, by studying associations between concentrations of PCB and PCDD/DFs (expressed as toxic equivalents, TEQs) in breast milk from 27 women (primiparas, 22-35 years). These women donated breast milk in 1996-1999 together with 183 other primiparas from Uppsala County, Sweden. Regression analyses showed that both dioxin-like and non-dioxin-like penta- to hepta-chlorinated PCBs could be used as markers of TEQ concentrations in this group of women, in some cases after age adjustment of the regressions. The strong positive association between concentrations of dioxin-like PCB/DD/DFs and non-dioxin-like PCBs will in future epidemiological studies make it difficult to separate Ah receptor-dependent effects from non-Ah receptor-dependent effects. With the use of regression equations and concentrations in breast milk samples collected in 1994, TEQ concentrations were estimated in the 1994 samples. Comparisons between estimated and measured concentrations indicated that associations between concentrations of marker substances and TEQs should be determined separately within each study population, in order to obtain reliable TEQ exposure assessments from PCB markers. (C) 2001 Academic Press.

Keywords: Coplanar PCB, PCDD, PCDF, Breastfeeding, Exposure Assessment, Fresh-Water Fish, Organochlorine Pesticides, Postnatal Exposure, Rat-Liver, PCBs, Infants, PCDDs, PCDFs, 2,3,7,8-Tetrachlorodibenzo-p-Dioxin, Contaminants

Gao, W.Z., Li, Z., Kaufmann, R.B., Jones, R.L., Wang, Z.G., Chen, Y.F., Zhao, X.Q. and Wang, N.F. (2001), Blood lead levels among children aged 1 to 5 years in Wuxi City, China. *Environmental Research*, **87** (1), 11-19.

Full Text: [E\Env Res87, 11.pdf](E/Env%20Res87,%2011.pdf)

Abstract: The objective of this study was to determine mean blood lead levels and prevalence of elevated blood lead levels among 1- to 5-year-old children in Wuxi City, China. By use of a representative cross-sectional survey that included measurements of capillary blood lead, 1117 children aged 1-5 years were examined from October through December, 1997. The geometric mean blood lead level for children 1-5 years of age in Wuxi City was 8.2 pg/dL (0.40 pmol/L), 27.3% had blood lead levels greater than or equal to 10 pg/dL and 1.0% had blood lead levels greater than or equal to 20 µg/dL. Blood lead levels were significantly higher for males and for those living in industrial areas, particularly the Beitang, Mashan, and Xinqu districts. Residence in these districts and in the Jiaoqu industrialized district also increased the likelihood of an elevated blood lead level, with odds ratios ranging from 2.59 to 4.53. In conclusion, blood lead levels among Wuxi City children are high enough to be of concern, particularly in industrial areas. Further studies are needed to better define the extent of lead exposure among children in China. In addition, national standards for blood lead collection and measurement methods should be applied in China. (C) 2001 Academic Press.

Keywords: Lead, Lead Exposure, Epidemiology, Children, China, National-Health, US Population, Exposure, Capillary, Nhanes

? Tariq, M.Y., Afzal, S. and Hussain, I. (2006), Degradation and persistence of cotton pesticides in sandy loam soils from Punjab, Pakistan. *Environmental Research*, **100** (2), 184-196.

Full Text: [2006\Env Res100, 184.pdf](2006/Env%20Res100,%20184.pdf)

Abstract: The present study evaluated the influence of temperature, moisture, and microbial activity on the degradation and persistence of commonly used cotton pesticides, i.e., carbosulfan, carbofuran, lambda-cyhalothrin, endosulfan, and monocrotophos, with the help of laboratory incubation and lysimeter studies on sandy loam soil (Typic Ustocurepts) in Pakistan. Drainage from the lysimeters was sampled on days 49, 52, 59, 73, 100, 113, and 119 against the pesticide application on days 37, 63, 82, 108, and 137 after the sowing of cotton. Carbofuran, monocrotophos, and nitrate were detected in the drainage samples, with an average value, respectively, of 2.34, 2.6 μg/L, and 15.6 mg/L for no-tillage and 2.16, 2.3 μg/L, and 13.4 mg/L for tillage. In the laboratory, pesticide disappearance kinetics were measured with sterile and nonsterile soils from 0 to 10 cm in depth at 15, 25, and 35°C and 50% and 90% field water capacities. Monocrotophos and carbosulfan dissipation followed first-order kinetics while others followed second-order kinetics. The results of incubation studies showed that temperature and moisture contents significantly reduced the t(1/2) (half-life) values of pesticides in sterile and nonsterile soil, but the effect of microbial activity was nearly significant that might be due to less organic carbon (0.3%). The presence of carbofuran and monocrotophos in the soil profile (0-10, 10-30, 30-60, 60-90, 90-150cm) and the higher concentrations of endosulfan and lambda-cyhalothrin in the top layer (0-10cm) showed the persistence of the pesticides. The detection of endosulfan and lambda-cyhalothrin in the 10-30 cm soil layer might be due to preferential flow. The data generated from this study could be helpful for risk assessment studies of pesticides and for validating pesticide transport models for sandy loam soils in cotton-growing areas of Pakistan. (c) 2005 Elsevier Inc. All rights reserved.

Keywords: Cotton, Pesticides, Nitrate-Nitrogen, Lysimeters, Shallow Groundwater, Tillage, No-Tillage, Dissolved Organic-Matter, Facilitated Transport, Shallow Groundwater, Water, Tillage, Sorption, Fate, Contamination, Napropamide, Metolachlor

# Title: Environmental Reviews

Full Journal Title: Environmental Reviews

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

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Publisher Address:

Subject Categories:

: Impact Factor

? McGuigan, C.F., Hamula, C.L.A., Huang, S., Gabos, S. and Le, X.C. (2010), A review on arsenic concentrations in Canadian drinking water. *Environmental Reviews*, **18**, 291-307.

Abstract: Recent events have increased public awareness of drinking water quality in Canada. The goal of this review was to examine how much information about arsenic (As) in Canadian drinking water is available. Provincial, territorial, and federal Web sites were searched for information about As in drinking water. Major scientific databases (PUBMED, Web of Science) were searched for drinking water As information for all provinces and territories. Resulting information was examined for availability, accessibility, quality, and timeliness. Most provinces provided at least basic fact sheets about As, and several provinces provided comprehensive databases containing actual test results. The vast majority of Canadian municipal drinking water systems with As data show a concentration below 10 mu g/L, the current guideline level. Several locations in Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, Nova Scotia, Quebec, and Saskatchewan have localized elevations of As (“hotspots”, >10 mu g/L As); this information is available at the provincial level, but may not include exact locations nor the degree by which they exceed the current guideline limit of 10 mu g/L. For other locations, however, little information is available. The lack of a centralized information source represents a significant obstacle to obtaining drinking water quality data. Although difficult to implement, a centralized and standardized source of national drinking water quality data is urgently needed to determine the effects of As and other contaminants on Canadians.

Keywords: Alberta, Arsenic, Awareness, Canada, Cold Lake, Contamination, Databases, Drinking Water, Environmental Contaminants, Groundwater, Human Exposure, Information, Public Health, Pubmed, Quebec, Review, Science, Speciation, Water Quality And Safety, Web of Science

# Title: Environmental Science & Policy

Full Journal Title: [Environmental Science & Policy](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6198&_auth=y&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=966187775eb6ce32dda8435aba052d53)

ISO Abbreviated Title:

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Journal Country/Territory:

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Publisher Address:

Subject Categories:

: Impact Factor

? Tress, G., Tress, B. and Fry, G. (2006), Publishing integrative landscape research: Analysis of editorial policies of peer-reviewed journals. *Environmental Science & Policy*, **9** (5), 466-475.

Full Text: [2006\Env Sci Pol9, 466.pdf](2006/Env%20Sci%20Pol9,%20466.pdf)

Abstract: Integrative research concepts such as interdisciplinarity and transdisciplinarity are gaining currency in landscape research as well as in the broader context of environmental science. Hence an increasing number of projects apply these approaches. Nonetheless, several epistemological and structural barriers hamper the operationalization of integrative research. Difficulty in publishing results from integrative research is referred to as one of the key problems for operationalization. Researchers and authors claim that it is difficult to publish findings from integrative research in international peer-reviewed journals and that suitable journals cannot be found. This paper analyses the editorial policies of international peer-reviewed journals towards publishing work resulting from integrative efforts in the field of landscape research. It investigates whether an editorial publication bias against integrative papers exists in scientific journals publishing landscape research articles. The study is based on an analysis of the aims and scope sections as published on the websites of 156 selected journals publishing landscape-related papers and on an E-mail survey of the editors of these journals. The editors were asked whether they accept integrative papers and what criteria they use for selecting reviewers. The majority of editorial policies as published on the journal websites ask explicitly or indirectly for integrative paper submissions. Almost all journal editors accept integrative papers and more than half of the editors select reviewers in part due to their knowledge of integrative research processes. We discuss the question of bias against integrative papers by editors, reviewers and authors and suggest some reasons why publishing integrative research can be difficult. This is due to the additional time needed to compile and write up integrative results, conceptual differences across research fields, lack of common terminology and difficulty in selecting the right journal. This study found no evidence to support the claim of an editorial bias against publishing integrative landscape research papers. The majority of editors of our sample welcome integrative research papers and encourage authors to submit their results from integrative landscape research to peer-reviewed journals.

Keywords: Aims and Scope, Bibliometrics, Interdisciplinarity, Journal Editors, Publication Bias, Transdisciplinarity

? Karlsson, S., Srebotnjak, T. and Gonzales, P. (2007), Understanding the North-South knowledge divide and its implications for policy: A quantitative analysis of the generation of scientific knowledge in the environmental sciences. *Environmental Science & Policy*, **10** (7-8), 668-684.

Full Text: [2007\Env Sci Pol10, 668.pdf](2007/Env%20Sci%20Pol10,%20668.pdf)

Abstract: The paper investigates the scientific knowledge divide in the environmental sciences between developed and developing countries and explores the implications and impacts on both science and policyrnaking. Quantitative data analysis of more than 6400 scientific papers published in 1993-2003 yield evidence for a growing divide in authorship, publication rates, and location of scientific research in nine environmental journals with high impact factor ratings. In addition to this severe imbalance in publication rates between developed and developing countries, we also find a research bias toward certain eco-climatic zones. More than 80% of papers are published in and about temperate and cold eco-climatic zones. Only 13% of the papers in our study are based on research in the dry sub-tropical and tropical zones, although these eco-climatic zones account for more than 52% of the world’s land area. Based on these results, we discuss how the limited empirical source and focus of environmental research undermine the claims of universality of environmental science and what consequences this may have on policymaking processes at different levels. Finally, we briefly explore some short- and long-term strategies to address the knowledge divide. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Authorship, Bibliometrics Eco-Climatic Zones, Data Analysis, Developing-Countries, Environmental Policy, Environmental Science, Impact, Impact Factor, Information, Knowledge Divide, Perspective, Quantitative Analysis, Science, Sciences

? Vasileiadou, E., Heimeriks, G. and Petersen, A.C. (2011), Exploring the impact of the IPCC Assessment Reports on science. *Environmental Science & Policy*, **14** (8), 1052-1061.

Full Text: [2011\Env Sci Pol14, 1052.pdf](2011/Env%20Sci%20Pol14,%201052.pdf)

Abstract: Even though critique to IPCC is certainly not new, the climate controversies of 2009 and 2010 brought this critique again to the fore in public media. The paper contributes to this ongoing debate, and investigates empirically the impact of the four Assessment Reports of the iPcc on scientific publications and science, through scientometric analyses of cited references to IPCC reports. The results indicate, among other things, that the aggregate impact of IPCC reports on scientific publications has increased through each consecutive assessment report, independently from the increase of the climate change field, showing a pattern which suggests that the references are quite generic. Both disciplinary distribution and geographical distribution of the impact of the reports are skewed, the former towards geophysical sciences, the latter towards western/developed countries. However, this skewness is decreasing over time. Given the increasing impact further away from the climate change field, it is important that the IPCC becomes more transparent about its internal processes and main conclusions. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Assessment, Climate Change, Climate-Change, Disciplinary Differences, Geographical Differences, Global Environmental Assessments, Impact, Intergovernmental Panel, IPCC, Publications, Reports, Science, Sciences, Scientific Publications, Scientometrics, South

# Title: Environmental Science and Pollution Research

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Environmental Sciences: Impact Factor 1.144, 65/134 (2004); Impact Factor 1.518, 46/140 (2005); Impact Factor 3.894, 10/160 (2007); Impact Factor 2.411, 51/181 (2009)

? Górna-Binkul, A. and Buszewski, B. (1997), Volatile organic air contaminants in plants - Comparative investigations of toluene sorption in fruit and chemically modified adsorbents. *Environmental Science and Pollution Research*, **4** (3), 125-129.

Abstract: Comparative investigations of the sorption process of gaseous toluene were performed using fruit material (orange peel) and the mixture of chemically bonded phases (CBPs) as sorbents. For this study, a specially constructed system that allows exposure of sorbents to volatile air contaminants at constant concentrations was applied. The results for the prepared packings indicate a typical adsorption process described by Langmuir isotherm. In the case of orange peel, a mixed mechanism of the sorption process is suggested.

Keywords: Accumulation, Adsorption, Airborne Organic Chemicals, Aromatic-Hydrocarbons, Coverage Density, Cuticles, Human Health, Lipophilic Chemicals, Model, Needles, Nutrition, Plants, VOCs, Orange, Orange Peel, Partition-Coefficients, Plants, VOCs, Prediction, Soil, Sorption Process In Fruit, Sorption Process, VOCs, Toluene, VOCs, VOCs, Fruit, Volatile Organic Air Contaminants

? Schoknecht, U., Wegner, R., Horn, W. and Jann, O. (2003), Emission of biocides from treated materials: Test procedures for water and air. *Environmental Science and Pollution Research*, **10** (3), 154-161.

Full Text: Env Sci Pol Res10, 154

Abstract: Methods for the determination of biocide emissions from treated materials into water and air were developed and tested in order to support a comparative ecological assessment of biocidal products. Leaching tests, experiments with simulated rain, extraction cleaning of carpets and emission chamber tests were performed with a series of treated materials. The experiments focused on the effect of changes in the procedure as well as characteristics of the specimens and demonstrate the suitability of the proposed methods for biocides of different product types. It was demonstrated that emissions of biocides into water can be compared on the basis of leaching tests in which the emission kinetics of the active ingredients are recorded. However, the water volume per surface area and the timetable for water changes have to be defined in such tests. Functions of flux rates related to time can be well described for inorganic compounds, whereas modelling of the data is more complicated for organic substances. Emission chamber tests using 20-litre and 23-litre glass exsiccators, originally developed to study volatile organic compounds, were successfully adapted for the investigation of the emission of biocides from treated materials which are usually semi volatile organic compounds. However, test parameters and the method of analysis have to be adapted to the substances to be determined. Generally, it was found that the emission curves for the semi volatile organic compounds investigated differ from those of volatile organic compounds.

Keywords: Air, Biocidal Products, Biocides, Biocides Directive, Emission, Emission Test Chambers, Environmental Exposure Assessment, Leaching Procedure, Simulated Rain, SVOC, Test Procedures, VOC, Water, Wood Preservatives, Wood Preservatives

? Laasri, L., Elamrani, M.K. and Cherkaoui, O. (2007), Removal of two cationic dyes from a textile effluent by filtration-adsorption on wood sawdust. *Environmental Science and Pollution Research*, **14** (4), 237-240.

Full Text: [2007\Env Sci Pol Res14, 237.pdf](2007/Env%20Sci%20Pol%20Res14,%20237.pdf)

Abstract: Background. Wastewater from textile industry contains various contaminants such as dyes, surfactants and heavy metals. Textile dyes have synthetic origin and complex aromatic molecular structures that make them difficult to biodegrade when discharged in the ecosystem. The objective of this study was to examine the decolourisation of textile effluents containing cationic dyes by filtration-adsorption on wood sawdust from two different origins; fir as an example of a conifer tree, and beech as an example of a deciduous one, and to explain the adsorption mechanism.

Methods. The process of dye removal was applied to a synthetic effluent in batch mode. Adsorption experiments were performed by suspending sawdust in the effluent and analyzing the supernatant by spectrophorometry. The effectiveness of the treatment process was evaluated by measuring coloration.

Results and Discussion. Experimental results showed a significant potential for wood sawdust, especially coniferous sawdust, to remove cationic dyes from textile effluents. Adsorption kinetics was influenced by the initial dye concentration, nature and amount of sorbent as well as sorbent particle size. The adsorption followed a pseudo first-order kinetics. For both basic dyes, the Langmuir adsorption equation showed a better fit than the Freundlich equation.

Conclusion. Filtration-adsorption using an inexpensive and readily available biosorbent provided an attractive alternative treatment for dye removal, and it does not generate any secondary pollution.

Recommendations and Perspectives. Laboratory studies provide promising perspectives for the utilization of wood sawdust as renewable adsorbent for reducing pollution while enhancing the reuse of textile effluents. However, the treatment process needs to be applied to the other textile dye classes in order to be used on an industrial scale.

Keywords: Cationic Dyes, Decolourisation, Filtration-Adsorption, Synthetic Effluent, Wood Sawdust, Reactive Dyes, Sorption

? Llanes-Monter, M.M., Olguín, M.T. and Solache-Ríos, M.J. (2007), Lead sorption by a Mexican, clinoptilolite-rich tuff. *Environmental Science and Pollution Research*, **14** (6), 397-403.

Full Text: [2007\Env Sci Pol Res14, 397.pdf](2007/Env%20Sci%20Pol%20Res14,%20397.pdf)

Abstract: Goal, Scope and Background. The retention of lead by a Mexican, clinoptilolite-rich tuff from Oaxaca (Mexico) at different pH values was evaluated and the lead sorption mechanisms on the zeolitic material in this work were discussed.

Methods. Isotherms were determined using lead nitrate solutions (initial pH values between 2 and 5) at 303 K. After the equilibrium was reached, the content of lead in the liquid phases was determined by atomic absorption spectrometry. The elemental composition of the clinoptilolite-rich tuff before and after the lead sorption process was evaluated by electron microscopy.

Results. The maximum ion exchange capacity of the Mexican, clinoptilolite-rich tuff for lead was 1.4 meq/g at pH 3, considering an ion exchange mechanism in the absence of any precipitated or hydrolyzed lead species in the sorption process or any change in the zeolite network. Langmuir and Freundlich isotherms were also considered in this work for comparison purposes.

Discussion. It is important to consider the nature of the sorption processes before choosing a model to describe the interaction between the metal ions and the sorbent.

Conclusions. The chemical lead speciation, the pH, as well as the characteristics of the clinoptilolite-rich tuff are important factors to be considered on the lead sorption process by natural zeolites. The chemical species involved in that process are Na+ from the zeolite and Pb2+ from the aqueous solution at pH 2 and 3, so that the ion exchange mechanism explains the lead sorption processes by the clinoptilolite-rich tuff through the ion exchange isotherms. The sodium, Mexican, clinoptilolite-rich tuff is a potential adsorbent for lead from aqueous solutions.

Recommendations and Perspectives. The natural zeolite-rich tuffs are very important as ion exchangers for the treatment of polluted water due to their sorption properties and low cost. The sorption behavior of each natural material depends on their composition. Mexican, clinoptilolite-rich tuff from Oaxaca (Mexico) could be used for the treatment of waste water contaminated with lead.

It would be important to propose this material as an alternative as waste water treatment, because it shows good selectivity for the removal of heavy metals from water.

Keywords: Clinoptilolite, Freundlich Isotherms, Ionic Exchange, Langmuir Isotherms, Lead, Mexican Clinoptilolite, Sorption, Zeolites, Ion-Exchange, Heavy-Metals, Waste-Water, Aqueous-Solutions, Zeolites, Removal, Cadmium, Erionite, Cobalt, Adsorption

? Pan, Y.F., Chiou, C.T. and Lin, T.F. (2010), Adsorption of arsenic(V) by iron-oxide-coated diatomite (IOCD). *Environmental Science and Pollution Research*, **17** (8), 1401-1410.

Full Text: [2010\Env Sci Pol Res17, 1401.pdf](2010/Env%20Sci%20Pol%20Res17,%201401.pdf)

Abstract: Economically efficient methods for removing arsenic from the drinking water supply are urgently needed in many parts of the world. Iron oxides are known to have a strong affinity for arsenic in water. However, they are commonly present in the forms of fine powder or floc, which limits their utility in water treatment. In this study, a novel granular adsorbent, iron-oxide-coated diatomite (IOCD), was developed and examined for its adsorption of arsenic from water. An industrial-grade diatomite was used as the iron oxide support. The diatomite was first acidified and dried and then coated with iron oxide up to five times. The prepared IOCD samples were characterized for their morphology, composition, elemental content, and crystal properties by various instruments. Experiments of equilibrium and kinetic adsorption of As(V) on IOCD were conducted using 0.1- and 2-L polyethylene bottles, respectively, at different pH and temperatures. Iron oxide (alpha-Fe2O3 hematite) coated onto diatomite greatly improves (by about 30 times) the adsorption of As(V) from water by IOCD as compared to using raw diatomite. This improvement was attributed to increases in both surface affinity and surface area of the IOCD. The surface area of IOCD increased to an optimal value. However, as the IOCD surface area (93 m(2)/g) was only 45% higher than that of raw diatomite (51 m2/g), the enhanced As(V) adsorption resulted primarily from the enhanced association of negatively charged As(V) ions with the partial positive surface charge of the iron oxide. The As(V) adsorption decreased when the solution pH was increased from 3.5 to 9.5, as expected from the partial charge interaction between As(V) and IOCD. The adsorption data at pH 5.5 and 7.5 could be well fitted to the Freundlich equation. A moderately high exothermic heat was observed for the As(V) adsorption, with the calculated molar isosteric heat ranging from -4 to -9 kcal/mol. The observed heats fall between those for physical adsorption and chemisorption and are indicative of the formation of a series of ion-pair complexes of As(V) ions with iron oxide surface groups. This study demonstrated that the granular IOCD was successfully developed and employed to remove the As(V) in aqueous solution. The Freundlich isotherm well fitted the equilibrium adsorption data of As(V) onto IOCD, and both the pseudo-second-order model and the pore diffusion model simulated well the adsorption kinetics. Compared to other iron-oxide-based adsorbents reported in the literatures, the adsorption capacity of IOCD is relatively high and its kinetics is fast.

Keywords: Activated Carbon, Adsorbent, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Kinetics, Aqueous Solution, Aqueous-Solutions, Arsenate Adsorption, Arsenic, Arsenic(V), As(V), As(V), As(V) Adsorption, Association, Capacity, Charge, Chemisorption, Coated, Composition, Data, Diatomite, Diffusion, Diffusion Model, Drinking Water, Drinking Water Supply, Equilibrium, Exothermic, First, Forms, Freundlich, Freundlich Equation, Freundlich Isotherm, Granular Ferric Hydroxide, Hematite, Improvement, Interaction, Ions, Iron, Iron Oxide, Iron Oxide Coating, Iron-Oxide, Isotherm, Kinetic, Kinetic Adsorption, Kinetics, Mass Transfer, Methods, Model, Morphology, Oxide, Oxides, pH, Physical, Polyethylene, Pore Diffusion, Pore Diffusion Model, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Model, Removal, Solution, Sorption, Support, Surface, Surface Area, Surface Charge, Surface Groups, Treatment, Utility, Value, Water, Water Supply, Water Treatment, World, Zero-Point

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Full Text: [2011\Env Sci Pol Res18, 857.pdf](2011/Env%20Sci%20Pol%20Res18,%20857.pdf)

Abstract: Introduction The nano-scale zero-valent iron (NZVI) was used for the removal of arsenite (As(III)) and arsenate (As(V)) in aqueous solution. Batch experiments were conducted to investigate the effects of initial pH, initial arsenic concentration, dissolved oxygen (DO), and ratio of As(III)/As(V) on arsenic removal. Materials and methods The NZVI synthesized by using NaBH4 and FeCl3 was put into use right after its synthesis. The arsenic treatment system of recirculation mode consists of a reactor with a liquid volume of 4.4 L, which provides dual function of reactants reaction and particles settling in one unit. Results and discussion Consequently, the pseudo-first order rate equations can be used to describe the removal kinetics for As(V) at pH 4 and 7, while the pseudo-second order reaction was observed for As(V) at pH 9 and As(III) at all pH’s studied. Arsenic removal rates of both As(V) and As(III) were lower in the system with lower DO. The rate of As(III) removal decreased with the increase of its initial concentration. In contrast, the removal rate of As(V) still remained significantly high as its initial concentration increased. Conclusions This study reveals that low pH and high DO will favor arsenic removal. With the mixture of As(III) and As(V), the total arsenic was removed faster than solution containing As(III) or As(V) alone. In addition, the mixture with higher fraction of As(V) resulted in higher arsenic removal.

Keywords: Adsorbents, Adsorption, Aqueous-Solution, Arsenate, Arsenic, Arsenic(Iii), Arsenite, Ferrihydrite, Groundwater, Iron, Kinetics, Nanoiron Particles, Nitrate Reduction, pH, Pseudo-First Order, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second-Order, Water, Zero-Valent Iron, Zero-Valent Iron, Zerovalent Iron

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Full Text: [2011\Env Sci Pol Res18, 1593.pdf](2011/Env%20Sci%20Pol%20Res18,%201593.pdf)

Abstract: Introduction Kinetic, thermodynamic, and equilibrium isotherms of the biosorption of uranium ions onto Padina sp., a brown algae biomass, in a batch system have been studied. Discussion The kinetic data were found to follow the pseudo-second-order model. Intraparticle diffusion is not the sole rate-controlling factor. The equilibrium experimental results were analyzed in terms of Langmuir isotherm depending with temperature. Equilibrium data fitted very well to the Langmuir model. The maximum uptakes estimated by using the Langmuir model were 434.8, 416.7, 400.0, and 370.4 mg/g at 10ºC, 20ºC, 30ºC, and 40ºC, respectively. Gibbs free energy was spontaneous for all interactions, and the adsorption process exhibited exothermic enthalpy values. Padina sp. algae were shown to be a favorable biosorbent for uranium removal from aqueous solutions.

Keywords: Adsorption, Aqueous-Solution, Biosorbent, Biosorption, Cadmium(II) Biosorption, Dye, Enthalpy, Equilibrium, Intraparticle, Intraparticle Diffusion, Isotherm, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Oedogonium Sp, Padina Sp Algae Biomass, Pb(II), Removal, Sorption, Temperature, Thermodynamic, Thermodynamics, Uranium, Waste-Water

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Full Text: [2012\Env Sci Pol Res19, 177.pdf](2012/Env%20Sci%20Pol%20Res19,%20177.pdf)

Abstract: Objective The present work was carried out to investigate the effects of temperature, initial pH, initial concentration, and contact time on the biosorption of lead (Pb) and cadmium (Cd) by modified stalk sponge of Zea mays using a batch technique. Methods The biomass was chemically modified with a 0.1 M NaCl solution. The lead and cadmium sorption process was evaluated at 20ºC, 30ºC, 40ºC, and 50ºC. Results The results showed that the modified stalk sponge of Z. mays had a good capacity for biosorption of Pb(II) and Cd(II). The kinetic behavior was described by the pseudo-second-order model for both metallic species. The experimental isotherms obtained at different temperatures were fit with Langmuir and Freundlich models. Thermodynamic parameters ΔH(0) and ΔS(0) were calculated using the van’t Hoff equation, and the results show that Pb(II) and Cd(II) sorption by modified stalk sponge of Z. mays is an exothermic and spontaneous process.

Keywords: Adsorption, Aqueous-Solutions, Biomass, Biosorption, Cadmium, Cd(II), Concentration, Equilibrium, Freundlich, Heavy-Metals, Ions, Isotherms, Kinetic, Kinetics, Langmuir, Lead, pH, Removal, Sorption, Temperature, Thermodynamic, Thermodynamic Parameters, Waste, *Zea Mays*

# Title: Environmental Science & Technology

Full Journal Title: [Environmental Science & Technology](http://www.ceps.com.tw/ec/ecJnlIntro.aspx?jnlcattype=1&jnlptype=4&jnltype=474&Jnliid=2818&newIssueiid=57023)

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Subject Categories:

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Full Text: [2007\Env Sci Tec30, 36.pdf](2007/Env%20Sci%20Tec30,%2036.pdf)

Abstract: Kinetics of adsorption of cadmium from aqueous solution by iron oxide coated sand (IOCS) was studied under different temperatures. Adsorption of Cd on IOCS was shown to be a two-step process, with rapid in initial 60min and followed by a much slower stage. Adsorption rate was increased as temperature increased. Elovich model, pseudo-first-order model, pseudo-second-order model, second-order model and intraparticle diffusion model were used to test experimental data, with the best performance of pseudo second-order model.

Keywords: Adsorption, Iron Oxide Coated Sand IOCS, Cadmium, Kinetics

# Title: Environmental Science & Technology

Full Journal Title: [Environmental Science & Technology](http://pubs.acs.org/loi/esthag); [Environmental Science & Technology](http://pubs3.acs.org/acs/journals/TOC.page?incoden=esthag&indecade=&involume=0&inissue=0)

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Subject Categories:

Engineering, Environmental: Impact Factor 3.751, 1/36 (1999); Impact Factor 3.035, 1/36 (2000); Impact Factor 2.707, 2/38 (2001); Impact Factor 3.123, 1/37 (2002); Impact Factor 3.592, 1/35 (2003); Impact Factor 3.557, 2/35 (2004); Impact Factor 4.054, 1/37 (2005); Impact Factor 4.363, 2/37 (2007); Impact Factor 4.630, 2/42 (2009); Impact Factor 4.827, 2/45 (2010)

Environmental Sciences: Impact Factor 3.751, 2/126 (1999); Impact Factor 3.035, 3/127 (2000); Impact Factor 2.707, 7/129 (2001); Impact Factor 3.123, 4/132 (2002); Impact Factor 3.592, 2/131 (2003); Impact Factor 3.557, 4/134 (2004); Impact Factor 4.054, 5/140 (2005); Impact Factor 4.363, 4/160 (2007); Impact Factor 3.898, 7/180 (2009); Impact Factor 4.827, 9/193 (2010)

Haque, R., Lindstrom, F.T., Freed, V.H. and Sexton, R. (1969), Kinetic study of the sorption of 2,4-D on some clays. *Environmental Science & Technology*, **2** (3), 207-211.

Full Text: [E\Env Sci Tec2, 207.pdf](E/Env%20Sci%20Tec2,%20207.pdf)

Abstract: Relatively little is known regarding the kinetics of sorption of herbicides from solution on surfaces. For this reason, a detailed study of the kinetics of sorption of 2,4-d on three clay surfaces (illite, kaolinite, and montmorillonite) has been made. Rate constants, activation energies, free energies of activation, heats of activation, and entropies of activation have been calculated for the sorption process. The rate constants depended on the nature of the clay and fell between 2 to 22 X lo-’ second-’. The rate constant decreased with an increase in the surface area. The amount of 2,4-d sorbed was minimum for kaolinite, whose surface area was also small. Temperature had little effect on the amount sorbed. Activation energies for the sorption process laid between 3 to 5 kcal. mole-’, with clays of larger surface area giving higher activation energies. The over-all sorption process has been explained in the light of the structure of 2,4-d and the clayflocculates.

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Full Text: [E\Env Sci Tec3, 918.pdf](E/Env%20Sci%20Tec3,%20918.pdf)

Abstract: Equilibrium measurements of the sorption of phenol and p-nitrophenol from aqueous solution by active carbon suggest a heterogeneity of active surface sites with respect to energy of adsorption. Desorption studies show the presence of significant hysteresis effects when long equilibration periods are involved, although these effects are much smaller when adsorption-desorption equilibria are attained more rapidly. Differences in surface properties for different carbons is sug- gested by more extensive sorption of phenol at lower surface coverages on a coconut carbon than on a coal carbon of similar surface area. Further, again for low surface coverages and the same coconut carbon, p-nitrophenol is sorbed more extensively than phenol. At higher surface coverages the sorption is apparently less specific, and the sorption isotherms tend to converge. Studies at various pH levels indicate that the capacity of active carbon for adsorption of the anionic forms of both phenol and p-nitrophenol is less than for the corresponding neutral species. There is no marked effect of pH on the sorption of the neutral form ofp-nitrophenol in the pH range from 2.0 to 6.5. The capacity for the neutral phenol molecule decreases significantly with decreasing pH in this same range, however, suggesting that the hydrated proton competes effectively with phenol for active surface sites.

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Full Text: [E\Env Sci Tec6, 58.pdf](E/Env%20Sci%20Tec6,%2058.pdf)

Abstract: A general purpose computer program especially adapted t o the study of acid-base and coordinative interactions and dissolution and precipitation in aqueous systems has been developed. The program uses the stability constant approach and the Newton-Raphson method for digital computation of equilibria. It is able t o handle numerous species and t o find the equilibrium set of solids. Gas phases are considered to be at constant partial pressures. The method is explained by use of the aqueous iron(III)~alcium-carbonate-phosphate system as an example. An application of the program to a system of 788 soluble species, 83 possible solids, and one gas-phase component is given as an illustration.

Friedman, M. and Waiss, Jr., A.C. (1972), Mercury uptake by selected agricultural products and by-products. *Environmental Science & Technology*, **6** (5), 457-458.

Full Text: [E\Env Sci Tec6, 457.pdf](E/Env%20Sci%20Tec6,%20457.pdf)

Abstract: Sorption of mercury compounds from water by various agricultural products was surveyed by specific atomic absorption spectroscopy. The best adsorbents found are polyphenolic materials-e.g., tannins-as in walnut expeller meal and peanut skins, and proteins, as in wool and feathers. At low pH, sorption of mercuric salts by wool roughly follows a Freundlich isotherm in the concentration range 0.001-20 g of Hg/l. Namely, log,, *x* E 0.33 log,, *C* + 1.9, in which *x* mg of Hg are bound per gram of wool from a solution with the residual concentration C, g of Hg/l. Sorption from methylmercuric chloride at pH 6 is about as much in the range 0.001-0.2 g of Hg/l. Reducing and alkylating wool with vinylpyridine (for instance) increased sorption 1.7 times. These data indicate the possible use of agricultural products to remove and recover mercury from contaminated materials.

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Abstract: Four chemically modified cotton celluloses were investigated for effectiveness in sorbing mercury (Hgz) from aqueous solutions. Effectiveness of these compositions was due to amine units of the following types: ethylenimine network polymer formed in the fibers, polyethylenimine sorbed on the filters, 2-diethylaminoethyl substituents in the cellulose, and 2-aminoethyl substituents in the cellulose. Cotton celluloses modified with 2-diethylaminoethyl or 2-aminoethyl substituents were the more effective compositions at concentrations of mercury above 1000 ppb. Cotton cellulose containing ethylenimine network polymer was most effective on the basis of the weight of the cellulosic composition. Sorbed mercury can be readily removed from the chemically modified cottons for recovery of the former and reuse of the latter.

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Abstract: Experiments were designed to study the kinetics of adsorption of two industrial dyes-Methylene blue (cationic) and sulfur blue (anionic)-by kaolinite and montmorillonite clays. The cationic dye was removed from aqueous solution a t a continuously decreasing rate from 10 mg/g min to 0.07 mg/g min by montmorillonite whereas kaolinite adsorbed the dye a t a faster and uniform rate of 16 mg/g min. The anionic dye was removed a t a uniform rate of 2.3 mg/g min by kaolinite and 2.6 mg/g min by montmorillonite. The apparent control of ion-exchange capacities and nature of exchange sites of the clays on the rates of color removal is pointed out.

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Full Text: [E\Env Sci Tec10, 773.pdf](E/Env%20Sci%20Tec10,%20773.pdf)

Abstract: In and around well-kept homes painted with low lead paints situated in a small urban community, large amounts of lead and cadmium are found. High trace metal amounts are also found a t nonresidential sites. Much of the lead is probably of automotive origin. Lead levels in dusts within homes average 600 ppm and 680 pg/m2. In nonresidential interiors, dusts average 1400 ppm Pb and 2040 pg Pb/m2. Unexpectedly high cadmium accumulations are found, especially in carpet dusts from rubber-backed carpets. High nonresidential settled dust and soil lead contents are due to higher traffic flows. The lead content of outdoor residential dust is 600-1950 ppm and 90-6640 wg/m2. These values increase several times around nonresidential sites. Lead and cadmium from trace urban dusts are a significant addition to the child body burden.

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Full Text: [1960-80\Env Sci Tec11, 714.pdf](1960-80/Env%20Sci%20Tec11,%20714.pdf)

Abstract: Several methods for treatment of data from toxicity tests to determine the median lethal concentration (LC50) are discussed. The probit and logit models widely used for these calculations have deficiencies; therefore, a calculational method, named thi “trimmed Spearman-Karber method”, is developed. Examples of actual and hypothetical bioassay test data are given, and comparisons are made of the abilities of these three methods to treat these data. The trimmed Spearman-Karber method is not subject to the problems of the probit and logit models, has good statistical properties, is easy to use, and is recommended for accurate and precise calculation of LC50 values and their 95% confidence interval end points.

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Full Text: [E\Env Sci Tec11, 1202.pdf](E/Env%20Sci%20Tec11,%201202.pdf)

Abstract: The behavior of ionic lead in soils of diverse characteristics is investigated. Soils have rather large capacities for immobilization of lead, and these may be reasonably predicted by a correlation function involving cation-exchange capacity and pH. Results demonstrate that the fixation of lead is principally caused by reactions involving essentially insoluble organic materials. Precipitation by carbonate and sorption by hydrous metal oxides appear to be of secondary importance. The conclusions are indirectly confirmed by previous reports involving plant uptake studies.

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Abstract: The roles of complexing ligands and pH in affecting trace metal adsorption at the sediment/water interface are determined in model experimental systems. The adsorption behavior of complexing ligands must be considered to determine the overall effect on Cu(II) or Ag(I) uptake on amorphous iron oxide. In some cases metal uptake is increased by the presence of adsorbed ligands at the surface. Other ligands form nonadsorbing complexes in solution and compete with the surface for coordination of metal ions. The results suggest that tf1he distribution of trace metals in natural aqueous systems may be controlled by surface binding on colloidal particles coated with humic compounds rather than reactions with simple oxide surface sites.

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Full Text: [E\Env Sci Tec13, 213.pdf](E/Env%20Sci%20Tec13,%20213.pdf)

Abstract: Median lethal concentration (96-h LC50) values for acute copper toxicity to 3-10-g cutthroat trout *(Salmo clarhi)* have been determined for nine different combinations of alkalinity, hardness, and pH. Equilibrium calculations were performed on the copper LC50 values, seven different soluble species of copper were considered: Cu2+, CuOH+, Cu(OH)2O, Cu2- (OH)22+, CuHCO3+, CUCO~O, and C U (C O ~) ~ ~ - . The acute toxicity of copper was inversely correlated with water hardness and alkalinity. At a given alkalinity, hardness determined the LC50, a t a given hardness, alkalinity determined the LC50. At a given alkalinity and hardness, the concentrations of the copper species were determined by the pH of the water. Under the conditions tested, Cu2+, CuOH+, Cu(OH)zO, and C U ~ (O H) ~ ~ + were toxic forms of copper to cutthroat trout, CuHCO3+, CUCO~O, and Cu(CO3)z2- were not toxic. Results of 11 96-h copper toxicity bioassays on 1- to 26-g rainbow trout *(Salmo gairdneri)* under uniform water chemistry conditions are also reported.

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Full Text: [E\Env Sci Tec13, 219.pdf](E/Env%20Sci%20Tec13,%20219.pdf)

Abstract: Soil attenuation of heavy metals from industrial leachates is dependent upon many factors. Data in this paper are based on field measurements from an active power plant fly ash disposal site and are organized via a thermodynamic approach which is facilitated by computer solutions to the equilibrium situation. Results for the site studied show that adsorption onto hydrous iron and manganese oxides is the major solubility control for cadmium, nickel, and zinc while precipitation of discrete phases controls for chromium, copper, and lead. The partitioning of heavy metals between solution and particulate phases is most affected by pH, p(FeOOH), p(MnO,), and P (S O ~ ~ -) .

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Full Text: [E\Env Sci Tec13, 305.pdf](E/Env%20Sci%20Tec13,%20305.pdf)

Abstract: This study shows how effectively trace amounts of chlorophenols are adsorbed by activated carbon under the competitive conditions encountered in natural waters. Chlorophenols are odor-producing contaminants which form in water supplies via the reaction between chlorine and phenol during disinfection, and activated carbon is one of the best-available methods for removing chlorophenols from water. Strong competition was observed between anionic and neutral species of dichlorophenol and trichlorophenol even a t the 1 pg/L level. of the competitive adsorption models studied, the Langmuir model best fit the observed data. Evaluation of the competitive adsorption between chlorophenols and humic substances, which are present in nearly all municipal water supplies, indicated that the presence of these materials decreased the capacity of carbon for chlorophenols. The extent of competition was dependent on the source of the humic substances and pH was found to have a significant effect on the adsorption of both chlorophenol and the humic substances.

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Full Text: [E\Env Sci Tec14, 66.pdf](E/Env%20Sci%20Tec14,%2066.pdf)

Abstract: This paper examines the adsorption of phenol and o-chlorophenol from aqueous solution onto activated carbon. The results show that granular activated carbon took up to 3 weeks to reach equilibrium with phenol and up to 5 weeks to reach equilibrium with o-chlorophenol. Powdered carbon isotherms took from 3 to 5 days to reach equilibrium. Up to 80% of the adsorptive equilibrium was reached in the first few hours, but the remaining capacity was utilized very slowly. This type of behavior can be described by a dual rate mechanism macropore-micropore adsorption model, which can be used to explain variations in isotherm behavior previously reported in the literature. The study clearly shows that extended contacting periods should be allowed during isotherm evaluations to ensure that equilibrium is obtained. Wherever possible, powdered carbon isotherms should be used instead of granular carbon isotherms.

Elliott, H.A. and Huang, C.P. (1980), Adsorption of some adsorption(II)-amino acid complexes at the solid-solution interface. Effect of ligand and surface hydrophobicity. *Environmental Science & Technology*, **14** (1), 87-93.

Full Text: [E\Env Sci Tec14, 87.pdf](E/Env%20Sci%20Tec14,%2087.pdf)

Abstract: The adsorption characteristics of Cu(II) in the presence of amphiphilic (polar-nonpolar) amino acids onto two fundamentally different solid surfaces, viz., alumina (y-AlpO3) and activated carbon, were investigated. Adsorption a t the relatively hydrophilic alumina surface was governed primarily by hydrogen bonding. Electrostatic repulsion between the adsorbate and the alumina surface prevented adsorption. The sequence of adsorption of Cu(II)-amino acid complexes on activated carbon corresponded directly to the ligand hydrophobicity: Cu-Phe > Cu-Leu > Cu-Val > Cu-Ala > Cu-Gly. This demonstrates the possibility of removing metals from aqueous solution by ligand complexation followed by adsorption onto an appropriate solid surface. The ligand must be bifunctional, possessing both a hydrocarbon and a polar moiety. The latter provides a complexation site for the metal ion, the hydrocarbon provides the wherewithal for hydrophobic bonding to the surface.

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Full Text: [1981\Env Sci Tec15, 463.pdf](1981/Env%20Sci%20Tec15,%20463.pdf)

Benjamin, M.M. and Leckie, J.O. (1981), Conceptual model for metal-ligand-surface interactions during adsorption. *Environmental Science & Technology*, **15** (9), 1050-1057.

Full Text: [E\Env Sci Tec15, 1050.pdf](E/Env%20Sci%20Tec15,%201050.pdf)

Abstract: Adsorption of trace metals from aqueous solution is dependent on pH, adsorbent and adsorbate concentration, and speciation of the metal in solution. In particular, complexation of metal ions by inorganic and organic ligands can dramatically increase or decrease adsorption compared to a ligand-free system. In this paper a semiquantitative model is presented to account for these changes. The model considers complexed species to be either “metallike” or “ligandlike”, depending on whether adsorption of the complex increases or decreases with increasing pH, respectively. Expected patterns for partitioning of the metal between the surface and solution are presented and shown to be qualitatively different for metallike and ligandlike complexes, particularly at low pH. This model can be combined with models for the charge-potential relationship in the electrical double layer to yield quantitative predictions.

Truitt, R.E. and Weber, J.H. (1981), Copper(II)-and Cadmium(II)-binding abilities of some new hampshire freshwaters determined by dialysis titration. *Environmental Science & Technology*, **15** (10), 1204-1208.

Full Text: [E\Env Sci Tec15, 1204.pdf](E/Env%20Sci%20Tec15,%201204.pdf)

Crist, R.H., Oberholser, K., Shank, N. and Nguyen, M. (1981), Nature of bonding between metallic ions and algal cell walls. *Environmental Science & Technology*, **15** (10), 1212-1217.

Full Text: [E\Env Sci Tec15, 1212.pdf](E/Env%20Sci%20Tec15,%201212.pdf)

Abstract: Metallic ions adsorbed by algal cell walls at pH 4.5 ranged from 600 to 100 pmol g-l for Cu2+ and Na+, respectively, with a pH dependence in the case of Sr2+ of -50 pmol g-l per pH unit. A reproducible pH titration was found which required -1000 pmol of NaOH per gram for pH 3-8. Protons displaced by metal adsorption gave the following ratios for H+ displaced/ M2+ adsorbed: 1.2 (Cu2+), 0.66 (Zn2+), 0.59 (Mg2+), 0.30 (Sr2+), and 0 (Na+). These ratios will vary some with concentration and pH. Ion exchange showed a strength of adsorption in the order Cu2+ > Sr2+ > Zn2+ > Mg2+ > Na+ suggesting a trend from probable covalent to ionic charge bonding. This latter was demonstrated directly by Na+ decreasing adsorption with positive metallic ion complexes and increasing it with negative ones. Ionic charge bonding was thought to arise from a surface charge generated by increasing pH, and covalent bonding from constitutent proteins.

Notes: highly cited

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Full Text: [1981\Env Sci Tec15, 1360.pdf](1981/Env%20Sci%20Tec15,%201360.pdf)

Abstract: Laboratory batch and column experiments have been conducted to elucidate the sorption behavior of nonpolar organic compounds (e.g., halogenated alkenes and benzenes) in a river water-groundwater infiltration system. For the low concentrations typical of the environment, sorption equilibria can be described by the equation S = K,C, where S = concentration in the solid phase, K, = partition coefficient, and C = concentration in the liquid phase. For a variety of sorbents, it was found that the partition coefficient KPZ of a particular compound Z can he estimated from its I-octanol/ water partition coefficient Kowz and from the organic-carbon (OC) content foc (fraction organic carbon) of the sorbents if foc is greater than 0.001: log KPZ = 0.72 lo Kowz + logfoc(s) + 0.49. Sorption was found to be reversible, but sorption kinetics may have an effect on material transport over the range of flow velocities encountered in aquifers. The conclusions of this study are applicable to a wide range of sorption and transport problems including artificial groundwater recharge and leaching of pollutants from landfills.

Keywords: Groundwater, Resources, Sorption, Transport, Water

Benjamin, M.M. and Leckie, J.O. (1982), Effects of complexation by Cl, SO4, and S2O3 on adsorption behavior of Cd on oxide surfaces. *Environmental Science & Technology*, **16** (3), 162-170.

Full Text: [E\Env Sci Tec16, 162.pdf](E/Env%20Sci%20Tec16,%20162.pdf)

Abstract: Adsorption of metal ions on oxide surfaces mediates the transport of these ions in natural aquatic systems as well as in many waste treatment operations. Often the metals exist in the bulk aqueous phase as complexes with inorganic or organic ligands. The effects of complexation by Cl, SO,, and S2O3on adsorption of Cd onto four different oxide solids have been studied. Increasing concentration of the ligand increases Cd adsorption in some cases and decreases it in others. All of the results are consistent with a model in which chloro and sulfato complexes are assumed to adsorb with the metal closer to the surface than the ligand, and thiosulfato complexes adsorb with the ligand closer than the metal.

Glooschenko, W.A. and Capobianco, J.A. (1982), Trace element content of northern Ontario peat. *Environmental Science & Technology*, **16** (3), 187-188.

Full Text: [E\Env Sci Tec16, 187.pdf](E/Env%20Sci%20Tec16,%20187.pdf)

Abstract: ES were collected at 0-20- and 20-40-cm epths from several peatland ecosystems located in orthern Ontario, Canada. Analysis was made for the trace etals Zn, Pb, Cu, Cr, Cd, and Hg. Concentration values n general were in the low ppm range and did not significantly differ in terms of peatland type or depth except for Pb. This element was significantly higher in surface peats in bogs and fens. Concentrations of metals in peats found in the study were equivalent to those in US coals, suggesting caution during combustion in terms of potential atmospheric input of metals.

Wiers, B.H., Grosse, R.J. and Cilley, W.A. (1982), Divalent and trivalent ion exchange with zeolite A. *Environmental Science & Technology*, **16** (9), 617-624.

Full Text: [E\Env Sci Tec16, 617.pdf](E/Env%20Sci%20Tec16,%20617.pdf)

Abstract: change isotherm for Ca2+ exchange with odium zeolite A was determined at 25°C by using a novel olid uptake analytical scheme and a Langmuir adsorption odel, resulting in an improved value for the thermodynamic equilibrium constant. Ion-exchange isotherms and pproximate thermodynamic equilibrium constants were lso determined for calcium zeolite A exchange with Pb2+, Cd2+, and Cu2+. Pb2+ and Cd2+ exchanges were found to e reversible, whereas Cu2+ exchange was not, probably ue to Cu(OH), (s) precipitation upon or within the zeolite. on exchange was attempted but found to be irreversible ith Cs+, Hg2+, Fe3+, and Al3+. Except for Cr3+, these ions aused zeolite A structure degradation, probably through xtensive proton exchange. Cr3+ exchanged partially and hen formed a precipitate. Data obtained in this work rovide an improved understanding of the possible environmental water effects of zeolite A.

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Benjamin, M.M. (1983), Adsorption and surface precipitation of metals on amorphous iron oxyhydroxide. *Environmental Science & Technology*, **17** (11), 686-692.

Full Text: [E\Env Sci Tec17, 686.pdf](E/Env%20Sci%20Tec17,%20686.pdf)

Abstract: The effects of Cd, Cu, Co, and Zn on sorption of CrO4 and SeO4 onto Fe2O3.H2O(am) have been investigated. Sorption of the anions is unaffected by the presence of the cations unless the cations form a surface precipitate, presumably M(OH),(s). Generally when such a precipitate forms, sorption of the anion increases. If a surface precipitate does not form, competition between the metal and the anion for surface sites and electrostatic effects of the cations on anion adsorption are both negligible, even at very high apparent adsorption densities of the metals (1 mol of M/mol of Fe). Adsorption of metals increases their tendency to precipitate in some systems and decreases it in others. The results suggest a technique which may be useful in detecting the formation of surface precipitates.

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? Mullin, M.D., Pochini, C.M., McCrindle, S., Romkes, M., Safe, S.H. and Safe, L.M. (1984), High-resolution PCB analysis: Synthesis and chromatographic properties of all 209 PCB congeners. *Environmental Science & Technology*, **18** (6), 468-476.

Full Text: [1984\Env Sci Tec18, 468.pdf](1984/Env%20Sci%20Tec18,%20468.pdf)

Schure, M.R., Soltys, P.A., Natusch, D.F.S. and Mauney, T. (1985), Surface area and porosity of coal fly ash. *Environmental Science & Technology*, **19** (1), 82-86.

Full Text: [E\Env Sci Tec19, 82.pdf](E/Env%20Sci%20Tec19,%2082.pdf)

Abstract: Results of surface area measurements and morphology studies on two size-fractionated samples of coal fly ash reveal that small ash particles are predominately nonporous spheres with irregular surface morphology. The surface area is dependent on particle size for both samples. For the sample taken from a particle collector it is shown that large surface areas are attributable to carbonaceous particles of highly porous character. The surface area of particles in a coal-fired power plant is suggested to be dependent on the point of collection.

Yonge, D.R., Keinath, T.M., Poznanska, K. and Jiang, Z.P. (1985), Single-solute irreversible adsorption on granular activated carbon. *Environmental Science & Technology*, **19** (8), 690-694

Full Text: [E\Env Sci Tec19, 690.pdf](E/Env%20Sci%20Tec19,%20690.pdf)

Abstract: Irreversible adsorption has been shown to influence activated carbon adsorption equilibria. To gain a better understanding of irreversible adsorption and its influence on adsorption equilibria, batch and continuous-flow single-solute adsorption experiments were conducted on five low molecular weight substituted phenols. Sorbate functional group type and position were shown to influence the degree of irreversible adsorption. Furthermore, the occurrence of irreversible adsorption was shown to influence the shape of the isotherm trace depending on the experimental procedure used for isotherm development.

Crittenden, J.C., Luft, P., Hand, D.W., Oravitz, J.L., Loper, S.W. and Ari, M. (1985), Prediction of multicomponent adsorption equilibria uaing ideal adsorbed soluyion theory. *Environmental Science & Technology*, **19** (11), 1037-1043.

Full Text: [E\Env Sci Tec19, 1037.pdf](E/Env%20Sci%20Tec19,%201037.pdf)

Abstract: The capability of ideal adsorbed solution theory (IAST) to predict multicomponent competitive interactions between the following volatile organic chemicals was tested: chloroform, bromoform, trichloroethene, tetrachloroethene, l, e-dibromoethane, and chlorodibromomethane. A total of seven mixtures that contained various combinations of two, three, and six solutes were tested for three commercially available activated carbons. The predictions were satisfactory for the 256 isotherm data that were collected. An error analysis was performed for various isotherms that are used to represent single solute data in IAST calculations. This analysis demonstrated that the Freundlich equation was sufficiently accurate in representing the data under certain simplifying assumptions, and the use of the Freundlich equation in IAST calculations resulted in a relatively straightforward expression to describe the multicomponent data. The multicomponent data for the mixtures were plotted as total organic halogen (TOX) and total organic carbon (TOC), and, when the mixture data were plotted in this manner, appeared to behave as a pseudo single solute.

Anderson, P.R. and Benjamin, M.M. (1985), Effects of silicon on the crystallization and adsorption properties of ferric oxides. *Environmental Science & Technology*, **19** (11), 1048-1053.

Full Text: [E\Env Sci Tec19, 1048.pdf](E/Env%20Sci%20Tec19,%201048.pdf)

Abstract: The effect of dissolved silicate on the bulk and surface properties of aged ferrihydrite was investigated. Under aging conditions where ferrihydrite crystallizes to goethite in less than 24 h in the absence of silicate, the solid remains noncrystalline for at least 1-2 weeks in its presence. Some of the dissolved Si associates with the solid, and the point of zero charge (PZC) of the solid decreases from about 8 to about 4 as the ratio Si/Fe in the solid increases from 0 to 0.35. Incorporation of the Si in the solid dramatically increases the solid’s binding strength for Cd but has relatively little effect on its strength for Cu, Co, or Zn. The binding strength for SeO3 decreases with Si content in the solid, correlating closely with the PZC.

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Darnall, D.W., Green, B., Henzl, M.T., Hosea, J.M., McPherson, R.A., Sneddon, J. and Alexander, M.D. (1986), Selective recovery of gold and other metal ions from an Algal biomass. *Environmental Science & Technology*, **20** (2), 206-208.

Full Text: [E\Env Sci Tec20, 206.pdf](E/Env%20Sci%20Tec20,%20206.pdf)

Abstract: In determining the abilities of microorganisms to remove metal ions from water, a number of investigators have shown that different metal ions bind to cell walls of bacteria, fungi, and algae. We have observed that the pH dependence of the binding of Au3+, Ag+, and Hg2+ to the algae Chlorella uulgaris is different than the binding of other metal ions. Between pH 5 and 7, a variety of metal ions bind strongly to the cell surface. Most of these algal-bound metal ions can be selectively desorbed by lowering the pH to 2, however, Au3+, Hg2+, and Ag+ are all bound strongly at pH 2. Addition of a strong ligand at different pHs is required to elute these ions from the algal surface. Algal-bound gold and mercury can be selectively eluted by using mercaptoethanol. An elution scheme is demonstrated for the binding and selective recovery of Cu2+, Zn2+, Au3+, and Hg2+ from an equimolar mixture.

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Full Text: [1986\Env Sci Tec20, 249.pdf](1986/Env%20Sci%20Tec20,%20249.pdf)

Abstract: Enzymatic methods have shown promise for removing aromatic compounds from (high-strength) industrial wastewater. The removal of these compounds was studied at low levels that might be encountered in surface waters which receive some industrial discharge. The results indicate that enzymatic oxidative coupling using horseradish peroxidase and hydrogen peroxide may be useful in eliminating some aromatics that are not well-removed in biological or physical water treatment, but the nature of the byproducts must be determined to assure that the produds are not more undesirable than the initial compounds.

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Dzombak, D.A., Fish, W. and Morel, F.M.M. (1986), Metal humate interactions. 1. Discrete ligand and continuous distribution models. *Environmental Science & Technology*, **20** (7), 669-675.

Full Text: [E\Env Sci Tec20, 669.pdf](E/Env%20Sci%20Tec20,%20669.pdf)

Abstract: In this paper we examine critically the theory underlying discrete and continuous multiligand models for metal humate binding. The concepts and equations that unify the various models are presented, and a general solution to the fundamental integral equation for ion binding in a multiligand system is given. Particular attention is paid to the continuous distribution models (normal distribution, affinity spectrum, and continuous stability function) which are relatively new tools in the field of metal-humate complexation. It is shown that the lower half and extreme right of the Gaussian ligand distribution assumed in the normal distribution model never affect metal speciation measurably and hence are not “knowable”. It is also shown that an affinity spectrum does not correspond to an actual distribution of ligands, rather, each peak in the spectrum indicates the most probable stability constant controlling metal binding in a particular region of the experimental formation function. Application of the affinity spectrum model leads to a set of discrete ligands. A close examination of the continuous stability function model shows that it contains implicitly the same assumption as the affinity spectrum approach and thus leads also to discrete ligands.

Notes: highly cited

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Full Text: [1986\Env Sci Tec20, 717.pdf](1986/Env%20Sci%20Tec20,%20717.pdf)

Abstract: Sorption kinetics of hydrophobic organic chemicals to and from suspended sediment and soil particles is described by a radial diffusive penetration model modified by a retardation factor reflecting microscale partitioning of the sorbate between intraaggregate pore fluids and the solids making up the aggregate grains. In light of this and other sorption kinetics models, a closed-loop-stripping apparatus with a photoionization detector operating in-line was used to examine the effects of sorbate hydrophobicity, sorbent particle size, and system temperature on solidsolution exchange over times of seconds to days. Our results indicate that a single effective diffusivity parameter, which is predictable from compound solution diffusivity, octanol-water partition coefficient, and sorbent organic content, density, and porosity, can be used to quantify the sorption kinetics.

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Full Text: [E\Env Sci Tec20, 895.pdf](E/Env%20Sci%20Tec20,%20895.pdf)

Abstract: The fitting of adsorption isotherm equations to experimental data is often an important aspect of data analysis. If the Langmuir and Freundlich isotherms are used, then consideration must be given to the proper weighting of the observations. Preferably nonlinear regression (nonlinear least squares) should be used since this enables these isotherms to be fitted directly and also enables other isotherms to be tested with little extra effort. Isotherms described here which are likely to show a wide range of applicability include the Tbth, modified Dubinin-Radushkevich, and multisite Langmuir isotherms. These can also describe competitive adsorption (binary exchange) reactions and are well suited for heterogeneous exchangers such as soils and sediments. Specific examples discussed are the adsorption of P and K by soils, Na-Cu exchange by montmorillonite, and Zn adsorption by ferrihydrite.

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Abstract: Seven samples of commercial “humic acids”, purchased from five different suppliers, were studied, and their characteristics were compared with humic and fulvic acids isolated from streams, soils, peat, leonardite, and a dopplerite sample. Cross-polarization and magic-angle spinning 13C NMR spectroscopy clearly shows pronounced differences between the commercial materials and all other samples. Elemental and infrared spectroscopic data do not show such clear-cut differences but can be used as supportive evidence, with the 13C NMR data, to substantiate the above distinctions. As a result of these differences and due to the general lack of information relating to the source, method of isolation, or other pretreatment of the commercial materials, these commercial products are not considered to be appropriate for use as analogues of true soil and water humic substances, in experiments designed to evaluate the nature and reactivity of humic substances in natural waters and soils.

Weber, Jr., W.J. and Smith, E.H. (1986), Removing dissolved organic contaminants from water. *Environmental Science & Technology*, **20** (10), 970-979.

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Full Text: [E\Env Sci Tec21, 243.pdf](E/Env%20Sci%20Tec21,%20243.pdf)

Abstract: Partition coefficients for the binding of pyrene to 14 different humic and fulvic acids were determined. Each of the humic materials was characterized by infrared and ultraviolet absorbance, elemental analysis, and, for four samples, 13C solid-state NMR. Partition coefficients normalized to the fraction of organic carbon in the humic material (KW’s) varied by as much as a factor of 10 depending upon the humic material. The magnitude of the *K,* values correlated strongly with three independent measures of the degree of aromaticity in the humic material. Thus, the binding of pyrene to dissolved humic and fulvic acids is modified to a significant extent by the degree of aromaticity in the humic material. This also suggests that the structure and composition of the humic material should be considered in any attempts to model the transport and fate of hydrophobic organic pollutants in aquatic environments.

Zachara, J.M., Girvin, D.C., Schmidt, R.L. and Resch, C.T. (1987), Chromate adsorption on amorphous iron oxyhydroxide in the presence of major groundwater ions. *Environmental Science & Technology*, **21** (6), 589-594.

Full Text: [E\Env Sci Tec21, 589.pdf](E/Env%20Sci%20Tec21,%20589.pdf)

Abstract: Chromate adsorption on amorphous iron oxyhydroxide was investigated in dilute iron suspensions as a single solute and in solutions of increasing complexity containing CO2(g), SOZ-(aq), H4SiO4(aq), and cations [K+, Mg2+, Ca”(aq)]. In paired-solute systems (e.g., CrO:--H2CO3\*), anionic cosolutes markedly reduce CrO42- adsorption through a combination of competitive and electrostatic effects, but cations exert no appreciable influence. Additionally, H4Si04 exhibits a strong time-dependent effect: CrO:- adsorption is greatly decreased with increasing H4Si04 contact time. In multiple-ion mixtures, each anion added to the mixture decreases CrO:- adsorption further. Adsorption constants for the individual reactive solutes were used in the triple-layer model. The model calculations are in good agreement with the CrO42- adsorption data for paired- and multiple-solute systems. However, the model calculations underestimate CrO42- adsorption when surface site saturation is appr6ached. Questions remain regarding the surface interactions of both CO2(aq) and H4Si04. The results have major implications for the adsorption behavior of CrO:- and other oxyanions in subsurface waters.

Weber, Jr., W.J. and Simth, E.H. (1988), Simulation and design models for adsorption processes. *Environmental Science & Technology*, **21** (11), 1040-1050.

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Full Text: [E\Env Sci Tec22, 755.pdf](E/Env%20Sci%20Tec22,%20755.pdf)

Abstract: Proton uptake by intact algal cells was found to consist of two processes: (1) a fast (<4 s) surface reaction and (2) a slow (2 h) diffusion of protons into cells. A pH titration technique measured only the rapid surface reaction that forms negative sites at higher pH. Adsorption of alkali, alkaline earth, and transition metal ions on algae was quantitatively represented by the Langmuir adsorption isotherm with its two parameters ym, the maximum amount of metal adsorbed, and *K,* the equilibrium constant taken as a measure of bond strength. Variations of these parameters with pH and type of metal indicate that metals adsorb to algal surfaces by electrostatic attraction to negative sites, such as carboxylate anions of poly(ga1aturonic acid) (pectin), as previously suggested.

Behymer, T.D. and Hites, R.A. (1988), Photolysis of polycyclic aromatic-hydrocarbons adsorbed on fly-ash. *Environmental Science & Technology*, **22** (11), 1311-1319.

Full Text: [E\Env Sci Tec22, 1311.pdf](E/Env%20Sci%20Tec22,%201311.pdf)

Abstract: A rotary photoreactor was used to simulate the environmental conditions encountered by particle-bound polycyclic aromatic hydrocarbons (PAH) in the atmosphere. Eighteen PAH adsorbed on carbon black and 15 coal fly ash samples of varying physical and chemical compositions were photolyzed. Photolytic half-lives were found to be highly dependent on the substrate. On low-carbon fly ash samples, PAH showed a wide range of half-lives, indicating a relationship between PAH structure and photochemical reactivity. On fly ash samples with a carbon content greater than -590, PAH showed half-lives similat to one another. This indicates that the photolytic process is independent of PAH structure and dependent on the physical and chemical nature of the fly ash. Substrates that stabilize reactive PAH are black or gray in color, these dark substrates adsorb the most light and prevent the light from getting to the PAH.

? Smith, E.H. and Weber, Jr., W.J. (1988), Modeling activated carbon adsorption of target organic-compounds from leachate-contaminated groundwaters. *Environmental Science & Technology*, **22** (3), 313-321.

Full Text: [1988\Env Sci Tec22, 313.pdf](1988/Env%20Sci%20Tec22,%20313.pdf)

Abstract: A relatively straightforward mathematical modeling technique employing a modified homogeneous surface diffusion version of the Michigan Adsorption Design and Applications Model was used to simulate and predict fixed-bed adsorber behavior with respect to two target organic compounds in a complex background water contaminated by leachate from a hazardous waste landfill. The approach applied was one in which model coefficients specific to the leachate mixture were evaluated for the target compounds and the leachate itself was considered only as unspecified background. The unspecified dissolved organic matter in the leachate reduced granular activated carbon adsorption capacities and rates for both target compounds relative to their respective values in waters containing no other organic species. A short-bed adsorber technique was employed for estimation of system-specific rate parameters for both single-component and dual-component combinations of the target compounds with the leachate background.

Notes: highly cited

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Full Text: [1989\Env Sci Tec23, 496.pdf](1989/Env%20Sci%20Tec23,%20496.pdf)

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Full Text: [1989\Env Sci Tec23, 713.pdf](1989/Env%20Sci%20Tec23,%20713.pdf)

Abstract: The short-bed adsorber (SBA) technique has been demonstrated to be an effective method for estimation of maw transport parameters for adsorption of target organic compounds from otherwise organic-free background waters. This work evaluates the procedure for the more pertinent circumstance in which a water or wastewater is not only comprised of target organic species but also contains complex and uncharacterized dissolved organic matter. The SBA is compared with other parameter estimation methods for adsorption of two target compounds from different background waters. A system-specific modeling approach is found to accommodate the variable impacts of different background waters on the equilibrium and kinetic relationships of the target species. Verification studies reveal that mass transfer parameters determined by the SBA technique generally yield more accurate predictions of fixed-bed adsorber breakthrough profiles for target compounds than do those determined by the other methods evaluated.

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Gupta, G.D. (1990), Mobile incinerator for toxic wastes. *Environmental Science & Technology*, **24** (12), 1776et seq.

Crist, R.H., Martin, J.R., Guptill, P.W., Eslinger, J.M. and Crist, D.R. (1990), Interaction of metals and protons with algae. 2. Ion exchange in adsorption and metal displacement by protons. *Environmental Science & Technology*, **24** (3), 337-342.

Full Text: [E\Env Sci Tec24, 337.pdf](E/Env%20Sci%20Tec24,%20337.pdf)

Abstract: Adsorption of Sr on Vaucheria released an equivalent amount of Ca and Mg, indicating that metal adsorption by alkali and alkaline-earth metals is an ion-exchange phenomenon based on electrostatic interactions. Release of protons when Cu was adsorbed demonstrated additional covalent bonding for this transition metal. Protonated ethylenediamine is adsorbed both as a cation similar to metals and as a neutral species, indicating the presence of additional bonding sites. When the pH of an algal suspension is decreased, Ca and Mg are released equivalent to the amount of proton uptake, which occurred in fast (<50 s) and slow (2 h) processes. Kinetic evidence suggests that the slow process represents rate-determining diffusion of Ca through a dense-phase structure of the alga.

Notes: highly cited

? Brusseau, M.L., Jessup, R.E. and Rao, P.S.C. (1990), Sorption kinetics of organic chemicals: Evaluation of gas-purge and miscible-displacement techniques. *Environmental Science & Technology*, **24** (5), 727-735

Full Text: [1990\Env Sci Tec24, 727.pdf](1990/Env%20Sci%20Tec24,%20727.pdf)

Abstract: The speciation of carbon (dissolved/particulate, organic/inorganic) and surface tension of a number of radiation fogs from the urban area of Zurich, Switzerland, were measured. The carbon species were dominated by “dissolved” organic carbon (DOC; i.e., the fraction that passes through a filter), which was typically present at levels of 40-200 mg/L. Less than 10% of the DOC was identified as specific individual organic compounds. Particulate organic carbon (POC) accounted for 26-41 ‘70 of the mass of the particles, but usually less than 10% of the total organic carbon mass. Inorganic carbon species were relatively minor. The surface tensions of all the measured samples were less than pure water and were correlated with their DOC concentrations. The combination of high DOC and POC and low surface tension suggests a mechanism for the concentration of hydrophobic organic contaminants in the fog droplet, which have been observed by numerous investigators.

Notes: highly cited

? Hutchins, S.R., Sewell, G.W., Kovacs, D.A. and Smith, G.A. (1991), Biodegradation of aromatic-hydrocarbons by aquifer microorganisms under denitrifying conditions. *Environmental Science & Technology*, **25** (1), 68-76.

Full Text: [1991\Env Sci Tec25, 68.pdf](1991/Env%20Sci%20Tec25,%2068.pdf)

Abstract: A series of laboratory tests were conducted to evaluate whether denitrification would be a suitable alternative for biorestoration of an aquifer contaminated with JP-4 jet fuel. Microcosms were prepared from both uncontaminated and contaminated aquifer material from the site, in an anaerobic glovebox, amended with nitrate, nutrients, and aromatic hydrocarbons, and incubated under a nitrogen atmosphere at 12-degrees-C. With uncontaminated core material, there was no observable lag period prior to removal of toluene whereas 30 days was required before biodegradation commenced for xylenes, ethylbenzene, and 1,2,4-trimethylbenzene. An identical test with contaminated aquifer material exhibited not only much longer lag periods but decreased rates of biodegradation; benzene, ethylbenzene, and o-xylene were not significantly degraded within the 6-month time period even though active denitrification occurred at this time. First-order biodegradation rate constants ranged from 0.016 to 0.38 day-1 for uncontaminated core material and from 0.022 to 0.067 day-1 for contaminated core material. Tests with individual compounds in uncontaminated core indicated that benzene and m-xylene inhibited the basal rate of denitrification. These data demonstrate that several aromatic compounds can be degraded under denitrifying conditions, but rates of biodegradation may be lower in material contaminated with JP-4 jet fuel.

Keywords: Soil-Water Systems, Anaerobic Degradation, Denitrification Conditions, Insitu Biorestoration, Organic-Compounds, Subsurface, Environments, Bacteria, Benzene, Sand

Notes: highly cited

Brusseau, M.L., Jessup, R.E. and Rao, P.S.C. (1991), Nonequilibrium sorption of organic chemicals: Elucidation of rate-limiting processes. *Environmental Science & Technology*, **25** (1), 134-142.

Full Text: [E\Env Sci Tec25, 134.pdf](E/Env%20Sci%20Tec25,%20134.pdf)

Abstract: The results of experiments designed to identify the process(es) responsible for nonequilibrium sorption of hydrophobic organic chemicals (HOCs) by natural sorbents are reported. The results of experiments performed with natural sorbents were compared to rate data obtained from systems wherein rate-limited sorption was caused by specific sorbate-sorbent interactions. This comparison showed that chemical nonequilibrium associated with specific sorbate-sorbent interactions does not significantly contribute to the rate-limited sorption of HOCs by natural sorbents. Transport-related nonequilibrium was also shown to not be a factor for the systems investigated. Hence, attempts were made to interpret the data in terms of two, sorption-related, diffusive mass-transfer conceptual models: retarded intraparticle diffusion and intraorganic matter diffusion. The analyses provide strong evidence that intraorganic matter diffusion was responsible for the nonequilibrium sorption exhibited by the systems investigated in this paper.

Keywords: Comparison, Diffusion, Evidence, Experiments, HOCS, Intraparticle Diffusion, Mass Transfer, Models, Nonequilibrium Sorption, Sorbents, Sorption

Cundy, V.A., Sterling, A.M., Lester, T.W., Jakway, A.L., Leger, C.B., Lu, C., Montestruc, A.N. and Conway, R.B. (1991), Incineration of xylene/sorbent packs: A study of conditions at the exit of a full-scale industrial incinerator. *Environmental Science & Technology*, **25** (2), 223-232.

Full Text: [E\Env Sci Tec25, 223.pdf](E/Env%20Sci%20Tec25,%20223.pdf)

Abstract: The dynamic response at the exit of an industrial incinerator to the batch loading of single plastic packs containing a xylene/sorbent mixture is presented. Average values of continuously recorded O2, CO2, CO, total hydrocarbon, and temperature are presented from two locations on a vertical cross section near the exit of the kiln. Data are compared for several operating modes including standard operation (without injection of turbulent air) and operation with tangentially oriented turbulent air injected at the closed end of the kiln. During each operating mode, data are also compared for two kiln rotation rates. Details accompanying the decomposition of a single pack, comparing the temporal responses of selected parameters with video images obtained from a viewport near the exit of the kiln, are reported. The data provide a much clearer picture, than heretofore possible, of conditions that exist in an industrial rotary kiln incinerator during treatment of periodically fed plastic packs. Considerable stratification is observed at the kiln exit during the treatment of the plastic packs for all operating conditions of the study. Significant bursts of xylene evolution, associated with pack dissolution and bed slumping, are inferred from continuous measurements of stable species and temperature, and also visual observation. Even during the most vigorous bursts, the incinerator stack emissions remained well within regulatory limits.

Wright, P.J. and Weber, J.H. (1991), Biosorption of inorganic tin and methyltin compounds by estuarine macroalgae. *Environmental Science & Technology*, **25** (2), 287-294.

Full Text: [E\Env Sci Tec25, 287-294.pdf](E/Env%20Sci%20Tec25,%20287-294.pdf)

Notes: highly cited

Ball, W.P. and Roberts, P.V. (1991), Long-term sorption of halogenated organic-chemicals by aquifer material. 2. Intraparticle diffusion. *Environmental Science & Technology*, **25** (7), 1237-1249.

Full Text: [E\Env Sci Tec25, 1237.pdf](E/Env%20Sci%20Tec25,%201237.pdf)

Abstract: The rate of sorptive uptake of tetrachloroethene (PCE) and 1,2,4,5-tetrachlorobenzene (TeCB) was studied on sandy aquifer material from Borden, ON, by use of a batch methodology designed to accurately measure sorption over long equilibration periods. Measured rates of uptake were interpreted with an intraparticle diffusion model and diffusive rate constants were determined for different size fractions of the Borden solids as well as with pulverized material. In general, measured rates were quite slow in comparison with previously reported results in other systems. The rate constants for TeCB were consistently lower than for PCE, with inverse correlation between observed rate constants and equilibrium distribution coefficients, consistent with a concept of retarded intraparticle diffusion. Good model fits with the coarsest size fractions and dramatic increases in rate with particle pulverization suggest that sorption occurs throughout the grain volume and that particle radius may be the appropriate length scale for diffusion. Based on measured particle size and independent estimates of porosity and internal retardation, effective pore diffusion coefficients are estimated to be roughly 2-3 orders of magnitude lower than bulk aqueous diffusivities, consistent with the low porosity of the calcareous rock fragments studied and an additional 3- to 20-fold rate reduction due to constrictive effects of pore size. Interpretations of results assuming intraorganic matter diffusion are also presented and discussed.

Keywords: Aquifer Material, Comparison, Diffusion, Diffusion Model, Equilibration, Equilibrium, Estimates, Intraparticle Diffusion, Intraparticle Diffusion Model, Methodology, Model, Particle Size, Pore Diffusion, Porosity, Rate Constants, Reduction, Size, Sorption

Notes: highly cited

? Brusseau, M.L. and Rao, P.S.C. (1991), Influence of sorbate structure on nonequilibrium sorption of organic-compounds. *Environmental Science & Technology*, **25** (8), 1501-1506.

Full Text: [1991\Env Sci Tec25, 1501.pdf](1991/Env%20Sci%20Tec25,%201501.pdf)

Abstract: We investigate the relationship between sorbate structure and nonequilibrium sorption. The rate-limited sorption of compounds representing eight classes of organic chemicals, including chlorinated benzenes, unsubstituted and alkyl-substituted aromatics, chlorinated ethenes and ethanes, chlorinated phenols, nitrogen heterocycles, s-triazines, substituted amides, and substituted ureas, was examined by use of a single sorbent (sandy aquifer material) and the miscible displacement technique. The breakthrough curves were analyzed by using a bicontinuum model wherein sorption is assumed instantaneous for a fraction of the sorbent and rate limited for the remainder. Sorbate structure was shown to exert minimal impact on the nature of rate-limited sorption for nonionic, low-polarity compounds comprising relatively simple structures and for ionogenic compounds in neutral form. In contrast, sorbate structure appeared to have a significant impact for compounds comprising more complex structures (i.e., pesticides). First-order reverse rate constants determined for the pesticides were at least 1 order of magnitude smaller than those of the non-pesticides. This difference was attributed to differences in degree of constraint on diffusion within the polymeric structure of organic matter.

Keywords: Aquifer, Chemicals, Columns, Displacement, Humic Acids, Kinetics, Matter Interactions, Nitrogen, Sediments, Solute Transport, Sorption

Trujillo, E.M., Jeffers, T.H., Ferguson, C. and Stevenson, H.Q. (1991), Mathematically modeling the removal of heavy metals from a wastewater using immobilized biomass. *Environmental Science & Technology*, **25** (9), 1559-1565.

Full Text: [E\Env Sci Tec25, 1559.pdf](E/Env%20Sci%20Tec25,%201559.pdf)

Abstract: A technique developed by the U.S. Bureau of Mines using biomass, sphagnum peat moss, immobilized in porous polysulfone beads selectively removed Zn, Cd, and other metals from a zinc mining wastewater to concentrations well below the National Drinking Water Standards. The objective of this paper was to obtain experimental data on the biosorption of several heavy metals onto the beads containing sphagnum peat moss and to develop the appropriate mathematical models that might be used to describe the multicomponent phenomena. Nonequilibrium multicomponent mathematical models were developed and experimental data obtained for the simultaneous, competitive adsorption of six metal ions from an actual wastewater for both batch kinetic and semicontinuous packed-bed experiments. Experimental results indicated a selectivity order of Al > Cd > Zn > Ca > Mn > Mg and that metal ion breakthroughs were quite sensitive to ionic concentrations and adsorptive capacity. In addition, it was observed that, for the packed-bed experiments, the adsorptive capacity of the beads appeared to increase after the first few cycles. Mathematical models provided effective multicomponent equilibrium constants, adsorptive capacities, and reduced overall mass-transfer coefficients. The constants obtained from the packed-bed model were in reasonable agreement with those obtained from the batch kinetic model.

Keywords: Y-Zeolites, *Rhizopus-arrhizus*, Adsorption, Separation, Biosorption, Xylenes, Ions, Accumulation, Parameters, Equilibria

Mckinley, J.P. and Jenne, E.A. (1991), Experimental investigation and review of the solids concentration effect in adsorption studies. *Environmental Science & Technology*, **25** (12), 2082-2087.

Full Text: [E\Env Sci Tec25, 2082.pdf](E/Env%20Sci%20Tec25,%202082.pdf)

Abstract: Abundant literature references suggest that unit adsorption (i.e., mass of adsorbate sorbed per unit mass of adsorbent) declines as the mass of available adsorbent per unit volume increases. Adsorption of cadmium by iron oxyhydroxide was experimentally quantified at pH 7.00 for equilibrium aqueous cadmium of 0.025-22000 nM and for suspended iron oxyhydroxide concentrations of 0.5-50 mmol/L. For the full range of solids concentrations, over all equilibrium cadmium concentrations, adsorption was approximated by a single Freundlich isotherm. An exception to this was slightly increased unit adsorption at high relative solids or low relative aqueous concentrations, which were inversely related. Examination of published accounts of the “solids concentration” effect-excluding those which are admittedly caused by experimental artifacts-revealed either inappropriate experimental design or errors of data interpretation.

Keywords: Amorphous Iron Oxyhydroxide, Oxide-Water Interface, Particle Concentration, Surface Ionization, Aquatic Systems, Sorption, Complexation, Partition, Model, Pollutants

Bartschat, B.M., Cabaniss, S.E. and Morel, F.M.M. (1992), Oligoelectrolyte model for cation binding by humic substances. *Environmental Science & Technology*, **26** (2), 284-294.

Full Text: [E\Env Sci Tec26, 284.pdf](E/Env%20Sci%20Tec26,%20284.pdf)

Abstract: An oligoelectrolyte model of humic substances is developed to explain ionic strength effects on copper and hydrogen ion titrations. After discussing the relevance of various polyelectrolyte models to humic substances, we choose a model in which the molecules are represented as impenetrable spheres. The electrostatic effect is calculated using numerical solutions of the appropriate nonlinear Poisson-Boltzmann equation. Incorporation of available data on molecular weight distribution, size, and functional group content of humic substances reduces the number of arbitrary fitting parameters. A simple model, containing two copper binding sites and an additional acidic site, and two size classes of impenetrable spheres, can successfully explain pH and copper titration data. In particular, the model results demonstrate the importance of size heterogeneity as a means of explaining the relatively small effect of ionic strength on pH titrations as compared to copper titrations. This difference is not attributable to the difference in charge between H+ and Cu2+ and suggests that an electrostatic model calibrated only on a pH titration cannot describe a copper titration or vice versa.

Keywords: Poisson-Boltzmann Equation, Poly-Electrolyte, Ion Binding, Molecular-Weight, Fulvic-Acids, Complexation, Copper, Heterogeneity, Distributions, Equilibria

Crist, R.H., Oberholser, K., McGarrity, J., Crist, D.R., Johnson, J.K. and Brittsan, J.M. (1992), Interaction of metals and protons with algae. 3. Marine algae, with emphasis on lead and aluminum. *Environmental Science & Technology*, **26** (3), 496-502.

Full Text: [E\Env Sci Tec26, 496.pdf](E/Env%20Sci%20Tec26,%20496.pdf)

Abstract: The proton uptake rate for intact cells of marine algae is 20 times faster than for freshwater (FW) species, partly due to a higher Na content, but also possibly due to differences in cell wall porosity. Metal displacement by protons on acidification (pH change from 7 to 1) shows two inflection ranges, one at ca. pH *5* due to the presence of carboxylate anions and the other at pH ca. 1.5 for sulfate groups. *Cladophora, Rhizoclonium, and Polysiphonia* each have the two inflection ranges, while *Enteromorpha and* freshwater *Vaucheria* (FW) each have only one, for sulfate and carboxylate, respectively. Sulfate analysis of *Cladophora* indicates a sulfate polymer content of ca. 8.2%, which is comparable to that estimated from metal release. Adsorption of Pb and A1 on *Rhizoclonium* under acidic conditions (metals present as ions) releases H, Ca, and Mg ions from the algae, while adsorption of Pb and Cd at pH 10 and A1 at pH 5, where these metal ions are present in very low concentration in equilibrium with solid hydroxide, also releases OH from the hydroxides.

? Kilduff, J. and Weber, Jr., W.J. (1992), Transport and separation of organic macromolecules in ultrafiltration processes. *Environmental Science & Technology*, **26** (3), 569-577.

Full Text: [1992\Env Sci Tec26, 569.pdf](1992/Env%20Sci%20Tec26,%20569.pdf)

Abstract: The membrane transport and separation characteristics of natural humic macromolecules and a model polyelectrolyte, poly(styrene sulfonate), in ultrafiltration systems employing hydrophilic, neutral, cellulosic-type membranes were studied. The application of a permeation model based on membrane flux equation was systematically validated for charged, random-coil polymers. It was possible to characterize transport behavior of various solute/membrane combinations by a single membrane permeation factor, which was found to depend strongly on solution ionic strength, but to be relatively independent of the ultrafiltration operating mode. It was determined that under certain conditions of solution ionic strength, molecular weight cutoff specifications provided by manufacturers may significantly exceed actual values for random-coil polymers. The findings of the study are considered in the several contexts of methodologies for assessing macromolecule coiling characteristics, macromolecule sample fractionation, and molecular weight determinations for natural organic matter.

Keywords: Activated Carbon Adsorption, Competitive Adsorption, Gac, Humic Substances, Matter, Natural Organic Matter, Organic Matter, Poly-Electrolytes, Size Exclusion, Waters

Murabayashi, M. and Moesta, H. (1992), Thermodynamic study on the reduction of the polychlorinated dibenzo-*p*-dioxins and dibenzofurans in incinerator exhausts. *Environmental Science & Technology*, **26** (4), 797-802.

Full Text: [E\Env Sci Tec26, 797.pdf](E/Env%20Sci%20Tec26,%20797.pdf)

Abstract: Reactions for the dechlorination or decomposition of polychlorinated dibenzo-p-dioxin (PCDD) and/or polychlorinated dibenzofuran (PCDF) were investigated thermodynamically, in order to develop techniques to prevent the release of PCDDs and PCDFs from municipal incinerators. The Gibbs energy of formation of PCDDs, PCDFs, and some organic compounds was calculated by using a computer program, which was based on statistical thermodynamics. It was found that CaO, Na2O.SiO2, or 2Na2O.SiO2 would promote the dechlorination reaction of PCDDs and PCDFs by receiving chlorine atoms and that such organic materials as butane or butene would help the reaction by giving hydrogen in the reactions. The calculation showed that thermal decomposition of PCDDs or PCDFs would not proceed at temperatures below 1100 K. Some ways to prevent the release of PCDDs and PCDFs from municipal incinerators were discussed.

Keywords: Fly-Ash

Notes: highly cited

? Pignatello, J.J. (1992), Dark and photoassisted Fe3+-catalyzed degradation of chlorophenoxy herbicides by hydrogen-peroxide. *Environmental Science & Technology*, **26** (5), 944-951.

Full Text: [1992\Env Sci Tec26, 944.pdf](1992/Env%20Sci%20Tec26,%20944.pdf)

Abstract: The herbicides 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T) were degraded in acidic aerated solutions of H2O2 and Fe2+ or Fe3+. Conditions leading to complete mineralization could be achieved using Fe3+/H2O2, which thereby became the focus of the study. Herbicide transformation by Fe3+ /H2O2 was sensitive to pH (optimum, 2.7-2.8) and was inhibited by methanol or chloride due to scavenging of the active oxidant, and by sulfate due to complexation of Fe3+. The corresponding polychlorophenol was a transient, low-yield intermediate. Dechlorination of 0.1 mM herbicide was rapid and quantitative. Conversion to CO2 ranged from about 40 to 70%, depending on [H2O2] (10-500 mM) and was independent of Fe oxidation state. Degradation was markedly accelerated by irradiation with visible light containing a small UV component. Photoassisted conversion of herbicides to CO2 was quantitative in less than 2 h using H2O2 to herbicide molar ratios as low as 5. The stoichiometry indicated dioxygen consumption.

Keywords: Fenton Reagent, Aqueous-Solution, Oxygen, Oxidation, Radicals, Acid, Ions, Decomposition, Hydroxylation, Photolysis

Mott, H.V. and Weber, W.J. (1992), Sorption of low molecular weight organic contaminants by fly ash: Considerations for the enhancement of cutoff barrier performance. *Environmental Science & Technology*, **26** (6), 1234-1242.

Full Text: [E\Env Sci Tec26, 1234.pdf](E/Env%20Sci%20Tec26,%201234.pdf)

Abstract: Experimental measurements indicate that class F fly ashes have significantcapacity for sorption of low molecular weight organic contaminants from aqueoussolution, the capacity being related to the carbon content and to other propertiesspecific to the fly ashes tested. Correlations of Freundlich sorption capacityparameters with the respective octanol-water partition coefficients and the aqueoussolubilities of the organic contaminants were highly significant. Transient diffusionexperiments verified that incorporation of fly ash into soil-bentonite cutoff barrierscan impart significant capacity for contaminant retardation in these barriers.Analysis of the experimental data suggests that the sorption process is rate limited *and* that assumptions of local equilibrium are not appropriate in the diffusive regimeof a soil-bentonite cutoff barrier. Simulations of the performance of a hypotheticalsoil-bentonite cutoff barrier amended with high-carbon fly ash suggest that suchamendments can provide significant improvement in performance with respect toretardation of contaminant breakthrough.

Keywords: Landfill-Leachate, Clay, Containment, Pollutants, Transport, Sites

Crist, R.H., Oberholser, K., Wong, B. and Crist, D.R. (1992), Amine-algae interactions: Cation exchange and possible hydrogen bonding. *Environmental Science & Technology*, **26** (8), 1523-1526.

Full Text: [E\Env Sci Tec26, 1523.pdf](E/Env%20Sci%20Tec26,%201523.pdf)

Abstract: The sorption of amines on algae in acid media was found to be similar to that of metals, which occurs via an ionexchange process. Protonated ethylenediamine and ethyl glycinate were found by 14C labeling to displace Ca,Mg in equivalent amounts on sorption by *Vaucheria* sp. In turn, they were displaced by Sr2+, thus demonstrating the process to be one of cation exchange associated with anionic cell wall components. By use of Ca,Mg release as the measure of sorption, seven monoamines gave Langmuir adsorption equilibrium constants, a measure of bonding strengths, of 77 f 10 N-’ and maxima of 409 f 46 pequiv g-l, indicating little structure effect. On the other hand, equilibrium constants for the Cz, C4 and C6 diamines were 317, 1361, and 1564 N-l, respectively. The low values for three amino acids (55 f 7 N-l) indicate a repulsive effect of carboxylate anions. Sorption of neutral ethylenediamine on algae occurs at pH 10, possibly due to hydrogen bonding to anions and hydroxyl groups.

Dickson, L.C., Lenoir, D. and Hutzinger, O. (1992), Quantitative comparison of De Novo and precursor formation of polychlorinated dibenzo-*p*-dioxins under simulated municipal solid waste incinerator postcombustion conditions. *Environmental Science & Technology*, **26** (9), 1822-1828.

Full Text: [E\Env Sci Tec26, 1822.pdf](E/Env%20Sci%20Tec26,%201822.pdf)

Abstract: Model studies were performed to determine quantitatively the predominance of two proposed pathways of polychlorinated dibenzo-p-dioxin (PCDD) formation during municipal refuse incineration: surface-catalyzed reactions of precursors occurring on fly ash and De Novo synthesis of PCDD and related compounds from reactions of particulate carbon. The relative yields of PCDD formed from the model precursor compound pentachlorophenol (PCP) were 72-99000 times higher than PCDD formed from the reactions of activated charcoal, air, inorganic chloride, and Cu(II) as catalyst under identical reaction conditions. Yields and homologue distributions of PCDD were strongly influenced by heating time, air flow rate, and temperature, with marked differences observed between the two pathways. Activated charcoal also catalyzed the formation of PCDD from PCP in the absence of Cu(II) and promoted the dechlorination of PCDD. We speculate that Cu(II) and carbon represent two different types of active catalytic species which could be present on the surface of municipal incinerator fly ash.

Keywords: De-Novo-Synthesis, Fly-Ash, Chlorinated Dibenzodioxins, Aromatic-Compounds, Combustion, Mechanisms, Model

Arar, E.J., Long, S.E., Martin, T.D. and Gold, S. (1992), Determination of hexavalent chromium in sludge incinerator emissions using ion chromatography and inductively coupled plasma mass spectrometry. *Environmental Science & Technology*, **26** (10), 1944-1950.

Full Text: [E\Env Sci Tec26, 1944.pdf](E/Env%20Sci%20Tec26,%201944.pdf)

Abstract: A unique approach is described using ion chromatography (IC) and inductively coupled plasma mass spectrometry (ICP-MS) for the determination of hexavalent chromium [Cr(VI)] in wastewater sludge incinerator emissions. Quartz fiber filters, spiked with an isotopically enriched (Cr-50 or Cr-53) chromate salt, were used to collect emission particulates. The enriched Cr(VI) isotope was used to monitor the reduction of Cr(VI) during sample collection using a pseudo-first-order reaction model and to calculate the rate of deposition of native Cr(VI) on the filters. At the end of the sampling period, the Cr(VI) was extracted from the filters with 0.1 N sodium hydroxide and determined by IC using postcolumn derivatization with 1, 5-diphenylcarbohydrazide. To determine the ratio of enriched Cr(VI) to the native Cr(VI) emitted from the incinerator, an additional aliquot of the sample extract was preconcentrated by IC and the isotopic composition of the Cr(VI) fraction determined by ICP-MS.

Keywords: Welding Fumes, Preconcentration, Oxidation

Notes: highly cited

Weber, Jr., W.J., McGinley, P.M. and Katz, L.E. (1992), A distributed reactivity molde for sorption by soils and sediments. 1. Conceptual basis and equilibrium assessments. *Environmental Science & Technology*, **26** (10), 1955-1962.

Full Text: [E\Env Sci Tec26, 1955.pdf](E/Env%20Sci%20Tec26,%201955.pdf)

Abstract: Contaminant sorption by soils and sediments is characterized as a multiple reaction phenomenon. The approach is predicated on the observation that most natural soils and sediments are intrinsically heterogeneous even at the microscopic scale, that is, variable in composition and structure at both interparticle and intraparticle scales. Heterogeneity is demonstrated for a number of soils which, on the basis of conventional macroscopic properties, would be considered “homogeneous”. That such heterogeneities are reflected in sorption reactions which differ between soils and between different fractions of soil is also demonstrated. A composite model, the distributed reactivity model (DRM), is introduced to characterize intrinsic heterogeneities in the properties and behaviors of soils and sediments and to capture the resulting nonlinearities of sorption isotherms. Finally, the significance of particle-scale heterogeneity and distributed reactivity is illustrated by using measured parameters and DRM calculations to characterize differences in the relative sorption behavior of soils comprising different mass fractions of differently reactive components.

Keywords: Synthetic Adsorbents, Activated Carbons, Aquifer Materials, Water-Treatment, Organic-Matter, Transport, Chemicals, Systems, Kerogen, Solids

Notes: highly cited

? Rogge, W.F., Hildemann, L.M., Mazurek, M.A., Cass, G.R. and Simoneit, B.R.T. (1993), Sources of fine organic aerosol. 2. Noncatalyst and catalyst-equipped automobiles and heavy-duty diesel trucks. *Environmental Science & Technology*, **27** (4), 636-651.

Full Text: [1993\Env Sci Tec27, 636.pdf](1993/Env%20Sci%20Tec27,%20636.pdf)

Abstract: Gasoline- and diesel-powered vehicles are known to contribute appreciable amounts of inhalable fine particulate matter to the atmosphere in urban areas. Internal combustion engines burning gasoline and diesel fuel contribute more than 21% of the primary fine particulate organic carbon emitted to the Los Angeles atmosphere. In the present study, particulate (d(p) less-than-or-equal-to 2 mum) exhaust emissions from six noncatalyst automobiles, seven catalyst-equipped automobiles, and two heavy-duty diesel trucks are examined by gas chromatography/ mass spectrometry. The purposes of this study areas follows: (a) to search for conservative marker compounds suitable for tracing the presence of vehicular particulate exhaust emissions in the urban atmosphere, (b) to compile quantitative source profiles, and (c) to study the contributions of fine organic particulate vehicular exhaust to the Los Angeles atmosphere. More than 100 organic compounds are quantified, including n-alkanes, n-alkanoic acids, benzoic acids, benzaldehydes, PAH, oxy-PAH, steranes, pentacyclic triterpanes, azanaphthalenes, and others. Although fossil fuel markers such as steranes and pentacyclic triterpanes can be emitted from other sources, it can be shown that their ambient concentrations measured in the Los Angeles atmosphere are attributable mainly to vehicular exhaust emissions.

Keywords: Polycyclic Aromatic-Hydrocarbons, Chromatography Mass-Spectrometry, Resolution Gas-Chromatography, Exhaust Particulate Matter, Meat-Cooking Operations, Los-Angeles, Biological Characterization, United-States, Urban Sources, Ambient Air

Leger, C.B., Cundy, V.A. and Sterling, A.M. (1993), A three-dimensional detailed numerical model of a field-scale rotary kiln incinerator. *Environmental Science & Technology*, **27** (4), 677-690.

Full Text: [E\Env Sci Tec27, 677.pdf](E/Env%20Sci%20Tec27,%20677.pdf)

Abstract: A detailed three-dimensional numerical model of baseline (support burners only) operation in a rotary kiln incinerator is presented. The focus of this model is on gas-phase fluid mechanics, neglecting solid waste combustion and radiative heat transfer. The model is compared to experimental data, and although relatively crude, it demonstrates remarkably good qualitative and quantitative predictive capability. The model demonstrates that thermal buoyancy is the cause of observed vertical stratification near the exit of the modeled kiln. The model also suggests that the addition of turbulence mixing air actually increases the degree of stratification rather than augmenting mixing, as had been previously suggested. Elucidating the mechanism by which this occurs has resulted in a reinterpretation of the experimental data. The model also suggests that there is probably a zone of recirculation across the kiln exit plane. A parametric study using the model shows that the location and quantity of leak air into the kiln have a major influence on the flow inside the kiln. The study suggests that preheating turbulence air may have little effect on gas-phase mixing. Overall, this modeling study has demonstrated that a relatively simple numerical model of a rotary kiln incinerator can provide valuable insight into the process, especially when used in conjunction with experimental data.

Keywords: In-Depth, Exit, Xylene

Kesraoulouki, S., Cheeseman, C. and Perry, R. (1993), Effects of conditioning and treatment of chabazite and clinoptilolite prior to lead and cadmium removal. *Environmental Science & Technology*, **27** (6), 1108-1116.

Full Text: [E\Env Sci Tec27, 1108.pdf](E/Env%20Sci%20Tec27,%201108.pdf)

Abstract: This paper characterizes two natural zeolites, chabazite and clinoptilolite, and investigates the effects of treatment and conditioning on the removal of Pb and Cd from effluent wastewaters. The results demonstrated that the as-received zeolites contained a complement of exchangeable K, Ca, and Na ions but exposing them to concentrated NaCl solutions converts them to a homoionic state in the Na form, which improves significantly their exchange capacity. Particle size was found to have no effect on the exchange, suggesting that the mechanism is not surface controlled. Pb and Cd removal results using as-received, conditioned, and treated zeolites showed that conditioning and treatment improved both the exchange capacity and the removal efficiency when operating at metal concentrations greater than 250 mg/L. NaOH-treated chabazite and clinoptilolite performed best with optimum Pd and Cd exchange capacities exceeding 200 mg/g. The chabazite exchange capacity performance was superior to the clinoptilolite’s for both Pd and Cd. This result was expected as chabazite characterization showed that it had a higher Al substitution of Si, which in turn will produce a negative framework favorable to higher cation exchange capability. Overall, metal removal efficiencies exceeding 99 % were achieved, revealing the natural zeolites potential in treating effluent contaminated with high levels of Pb and Cd.

Horng, J.Y. and Huang, S.D. (1993), Removal of organic dye (Direct Blue) from synthetic wastewater by adsorptive bubble separation techniques. *Environmental Science & Technology*, **27** (6), 1169-1175.

Full Text: [E\Env Sci Tec27, 1169.pdf](E/Env%20Sci%20Tec27,%201169.pdf)

Abstract: C.I. Direct Blue 1, an anionic dye, was removed from synthetic wastewater by ion flotation of Direct Blue-hexadecyltri-methylammonium complex. Over 98% of Direct Blue was removed from the solution in 5 min. A stoichiometric amount of surfactant was found to be most effective for Direct Blue removal. The separation efficiency increased with increasing rate of air flow and decreased with increasing concentration of NaNO3. The efficiency of separation of Direct Blue by solvent sublation is similar to that by ion flotation. Direct Blue was also removed by adsorbing colloid flotation with Fe(OH)3 floc. Sodium lauryl sulfate was used as the collector and frother and 99.8% of Direct Blue was removed in 3 min. The separation efficiency decreased with increasing ionic strength of the solution. Use of Al(III) ion as activator compensates somewhat for the deleterious effect of neutral salt on the adsorbing colloid flotation of Direct Blue. Both ion flotation and adsorbing colloid flotation may find application in the removal of organic dye from wastewater.

Keywords: Adsorbing Colloid Flotation, Solvent Sublation, Refractory Organics, Aqueous-Solution, Aeration, Extraction, Water, Red

McGinley, P.M., Katz, L.E. and Weber, Jr., W.J. (1993), A distributed reactivity model for sorption by soils and sediments. 2. Multicomponent systems and competitive effects. *Environmental Science & Technology*, **27** (8), 1524-1531.

Full Text: [E\Env Sci Tec27, 1524.pdf](E/Env%20Sci%20Tec27,%201524.pdf)

Abstract: The uptake of individual hydrophobic organic compounds (HOCs) from aqueous solution by soils which exhibit heterogeneous reactivity is shown to be reduced in the prpaerce of other HOCs. The observed behavior is consistent with expectations for competitive surface adsorption phenomena, being most marked at low solutionphase Concentrations and coinciding with single-solute isotherm nonlinearity. Nonlinear sorption and competitive effects appear to relate to components or fractions of soil having different reactivity than that commonly attributed to qoil organic matter. In particular, HOC uptake by the organic components of soils deriving from certain sedimentary rocks appears to occur by surface reactions rather than by partitioning to organic matrices. Ideal adsorbed solution theory (IAST) is used to predict mixed-solute competitive effects from single-solute sorption isotherms. The results are examined within the context of the distributed reactivity model (DRM), wherein overall sorption behavior by heterogeneous solids is explicitly attributed to different mechanisms. Competitive reductions in the sorption of HOCs in systems dominated by nonlinearly sorbing soil components and characterized by a two-compartment DRM are found to he modeled reasonably well with IAST.

Keywords: Adsorption, Aquifer, Equilibrium, Organic Matter, Organic-Compounds, Solute Transport, Sorption, Toluene

Notes: highly cited

? Pignatello, J.J., Ferrandino, F.J. and Huang, L.Q. (1993), Elution of aged and freshly added herbicides from a soil. *Environmental Science & Technology*, **27** (8), 1563-1571.

Full Text: [1993\Env Sci Tec27, 1563.pdf](1993/Env%20Sci%20Tec27,%201563.pdf)

Abstract: Elution of atrazine and metolachlor residues from a long-contaminated soil under saturated flow was compared to elution of freshly-injected compounds from the same soil. The mobility of the injected herbicide was far greater than the native. A two-compartment diffusion sorption model-having a fast compartment S1 in rapid exchange with water and a slow compartment S2 with exchange by radial diffusion kinetics-gave good simultaneous fits to native and injected elution curves and predicted flow rate effects and postleaching soil herbicide profiles. An analogous model with first-order kinetics was less successful. The diffusion model parameters indicated that (i) at apparent equilibrium, the bulk (82-92%) of the sorbate was in S2; (II) the short-term (24-h) batch partition coefficient greatly underestimates the apparent true value and instead reflects partitioning into S1; and (iii) the time scale for sorption is many months. The absence of particle-size size effects on desorption rates suggests that the diffusive medium of S2 is microparticles or microstructures (less-than-or-equal-to 1 mum) distributed among all particle-size fractions.

Keywords: Aliphatic Halocarbons, Aquifer Material, Aromatic-Hydrocarbons, Desorption, Equilibrium, Halogenated Organic-Chemicals, Kinetics, Long-Term Sorption, Nonequilibrium Sorption, Partitioning, Slowly Reversible Sorption, Solute Transport, Sorption, Water

Fängmark, I., van Bavel, B., Marklund, S., Strömberg, B., Berge, N. and Rappe, C. (1993), Influence of combustion parameters on the formation of polychlorinated dibenzo-*p*-dioxins, dibenzofurans, benzenes, and biphenyls and polyaromatic hydrocarbons in a pilot incinerator. *Environmental Science & Technology*, **27** (8), 1602-1610.

Full Text: [E\Env Sci Tec27, 1602.pdf](E/Env%20Sci%20Tec27,%201602.pdf)

Abstract: A laboratory-scale fluidized-bed incinerator was used to study the influence of several combustion parameters with respect to the emission of important aromatic contaminants including polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs), polychlorinated benzenes (PCBz), polyaromatic hydrocarbons (PAHs), and polychlorinated biphenyls (PCBs). The parameters studied include bed temperature, O2-concentration, variations in HCl and H2O, and temperature and residence time in the postcombustion zone. A two-level fractional factorial design was used for planning the experiments. Flue gas samples were collected and analyzed on HRGC-HRMS. The most important parameter for the formation of the above chlorinated aromatics was found to be the residence time in the postcombustion zone. A substantial formation of the chlorinated compounds occurred during residence times as short as 1.6 s. PAH formation was found to be influenced by the oxygen concentration in the combustion air, and good combustion conditions favor low PAH emissions.

Keywords: Municipal Waste Incinerators, Fly-Ash, Aromatic-Hydrocarbons, PCDD PCDF, Emissions, Refuse, MSW

? Meng, X.G. and Letterman, R.D. (1993), Modeling ion adsorption on aluminum hydroxide modified silica. *Environmental Science & Technology*, **27** (9), 1924-1929.

Full Text: [1993\Env Sci Tec27, 1924.pdf](1993/Env%20Sci%20Tec27,%201924.pdf)

Abstract: The effect of component hydroxide and oxide interaction on Cd2+ and SO42- adsorption in suspensions of Al(OH) 3/SiO2 was modeled using two kinds of surface site distributions incorporated in the triple-layer surface complexation model. The mixed site distribution assumes that Al(OH)3 surface sites are uniformly distributed on the SiO2 surface with the overall surface potential contributed by both Al(OH)3 and SiO2 surface sites. The patch site distribution assumes that two kinds of surfaces are present on the particle and that the double layer associated with one surface does not affect surface reactions on the other. Enhanced Cd2+ adsorption and reduced SO42- adsorption at low Al to SiO2 ratios were modeled using the mixed site distribution. The modeling results suggest that the change in surface potential caused by the formation of AI(OH)3 on SiO2 surface has significant effects on Cd2+ and SO42- adsorption.

Keywords: Adsorption, Cadmium, Complexation, Distribution, Distributions, Electrical Double-Layer, Interaction, Model, Modeling, Oxide-Water Interface, Particle, Sites, Surface Reactions, Surface-Ionization, Surfaces, Suspensions

? Ngabe, B., Bidleman, T.F. and Falconer, R.L. (1993), Base hydrolysis of *α*- and *γ*-hexachlorocyclohexanes. *Environmental Science & Technology*, **27** (9), 1930-1933.

Full Text: [1993\Env Sci Tec27, 1930.pdf](1993/Env%20Sci%20Tec27,%201930.pdf)

Abstract: Hexachlorocyclohexanes (HCHs) are the most abundant organochlorine pesticides in the world’s oceans and large lakes, and knowing their chemical reactivity is important for determining environmental fate. Hydrolysis of alpha- and gamma-HCHs was carried out in buffered distilled water poisoned with sodium azide in dark, tightly sealed bottles to avoid biodegradation, photolysis, and volatilization losses. Experiments were run at (a) constant temperature (45-degrees-C) and PH 7-9 and (b) constant pH (9) and 5-45-degrees-C over times of 4-248 d, depending on reaction conditions. At constant pH, breakdown of the HCHs followed pseudo-first-order kinetics. Second-order base rate constants (k(b), M-1 min-1) were calculated from pseudo-first-order rate constants (k’, min-1), the measured pH, and the ion product of water as a function of temperature. At 20-degrees-C, values of k(b) were 1.57 (alpha-HCH) and 1.10 (gamma-HCH). From the variation in k(b) with temperature, activation energies of 78.3 and 84.6 kJ/mol were determined for alpha-HCH and gamma-HCH. At pH 7, reaction with H2O contributed to the breakdown of the HCHs; estimates of the neutral rate constant (k(n), min-1) were 1.1×10-6 (alpha-HCH) and 2.0×10-6 (gamma-HCH). At pH 8 and 5-degrees-C, hydrolytic half-lives of alpha-HCH and gamma-HCH were 26 and 42 yr. The relative contribution of hydrolysis to removing HCHs from cold, deep water in oceans and lakes requires that rates of other processes such as sedimentation and microbial attack be better established.

Keywords: Water, Contaminants, Degradation, Pollutants, Ontario, Air

Pennell, K.D., Abriola, L.M. and Weber, Jr., W.J. (1993), Surfacetant-enhanced solubilization of residual dodecane in soil columns. 1. Experimental investigation. *Environmental Science & Technology*, **27** (12), 2332-2340.

Full Text: [E\Env Sci Tec27, 2332.pdf](E/Env%20Sci%20Tec27,%202332.pdf)

Abstract: The solubilization of dodecane by polyoxyethylene (20) sorbitan monooleate, a nonionic surfactant, was investigated as a potential means of recovering nonaqueous-phase liquids from contaminated aquifers. Residual saturations of dodecane were established by injecting C-14-labeled dodecane into water-saturated soil columns and displacing the free product with water. Flushing with a 43 g/L surfactant solution increased the concentration of dodecane in the column effluent by 5 orders of magnitude. However, effluent dodecane concentrations were considerably less than the equilibrium value of 3500 mg/L measured in batch studies. Subsequent column experiments conducted at several flow velocities and with periods of flow interruption confirmed the existence of rate-limited, rather than instantaneous, solubilization of residual dodecane. The results of this study demonstrate the sizable capacity of surfactant solutions to enhance the recovery of residual dodecane, even under conditions of rate-limited solubilization.

Keywords: Nonaqueous Phase Liquid, Non-Ionic Surfactants, Subsurface Systems, Water, Adsorption, Contaminants, Dissolution, Sorption, Aquifer, Flow

Notes: highly cited

? Connaughton, D.F., Stedinger, J.R., Lion, L.W. and Shuler, M.L. (1993), Description of time-varying desorption kinetics: Release of naphthalene from contaminated soils. *Environmental Science & Technology*, **27** (12), 2397-2403.

Full Text: [1993\Env Sci Tec27, 2397.pdf](1993/Env%20Sci%20Tec27,%202397.pdf)

Abstract: Release rates of naphthalene from suspensions of freshly contaminted (days to weeks) and aged (approximately 30 years) soil samples were obtained using a gas purge method. A continuously increasing resistance to desorption was observed with increasing purge time. Initial desorption rates were similar to those estimated using available empirical relationships, but subsequent desorption rates were lower by more than 1 order of magnitude. A model incorporating a continuum of compartments with a gamma (GAMMA) distribution of rate coefficients was postulated to describe the experimental data. An analytical equation with two adjustable parameters was obtained for the mass fraction desorbed. Release profiles with this “GAMMA model” were able to describe the experimental release profiles for long term desorption experiments. An implication of the gamma model is that increased incubation time will allow organic compounds to be sorbed to compartments or regions in the sorbent that exhibit slow adsorption/desorption kinetics. This has important implications for the fate and remediation of sites that have been contaminated with hydrophobic organic compounds for extended time periods.

Keywords: Behavior, Chemicals, Degradation, Desorption, Diffusion, Kinetics, Naphthalene, Nonequilibrium, Organic-Compounds, Remediation, Sediments, Sorption Kinetics, Transport, Trichloroethylene

Notes: highly cited

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Full Text: [1994\Env Sci Tec28, 38.pdf](1994/Env%20Sci%20Tec28,%2038.pdf)

Abstract: The adsorption and desorption mechanisms of natural organic matter (NOM) on mineral surfaces are not completely understood because of the heterogeneity and complexity of NOM and adsorbent surfaces. This study was undertaken to elucidate the interaction mechanisms between NOM and iron oxide surfaces and to develop a predictive model for NOM adsorption and desorption. Results indicated that ligand exchange between carboxyl/hydroxyl functional groups of NOM and iron oxide surfaces was the dominant interaction mechanism, especially under acidic or slightly acidic pH conditions. This conclusion was supported by the measurements of heat of adsorption (microcalorimetry), FTIR and C-13 NMR analysis, and competitive adsorption between NOM and some specifically adsorbed anions. A modified Langmuir model was proposed in which a surface excess-dependent affinity parameter was defined to account for a decreasing adsorption affinity with surface coverage due to the heterogeneity of NOM and adsorbent surfaces. With three adjustable parameters, the model is capable of describing a variety of adsorption isotherms. A hysteresis coefficient, h, was used to describe the hysteretic effect of adsorption reactions that, at h = 0, the reaction is completely reversible, whereas at h = 1, the reaction is completely irreversible. Fitted values of h for NOM desorption on iron oxide surfaces ranged from 0.72 to 0.92, suggesting that the adsorbed NOM was very difficult to be desorbed at a given pH and ionic composition. Our results imply that a better mechanistic understanding of the interaction between NOM and oxide surfaces is needed to improve our predictive capabilities in NOM transport and cotransport of contaminants associated with NOM or iron oxides.

Keywords: Acid, Adsorption, Aluminum, Chemicals, Competitive Adsorption, Coverage, Desorption, Environment, FTIR, Heterogeneity, Humic Substances, Interaction, Isotherms, Montmorillonite, Retention, Soils, Sorption, Transport

Notes: highly cited

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Full Text: [1994\Env Sci Tec28, 63.pdf](1994/Env%20Sci%20Tec28,%2063.pdf)

Abstract: The mechanisms controlling desorption rates from soils and sediments were investigated by measuring TCE desorption kinetics from model solids, sediments, and soil under unsaturated conditions at 100 % relative humidity. A new experimental methodology enabled measurement of desorption rates over more than 7 orders of magnitude and revealed that intraparticle pores of molecular dimensions may be responsible for the slow release of sorbed contaminants. Desorption kinetics proceeded on two distinct time scales, and all solids had both a fast and slowly released fraction. The amount of slow desorbing TCE was found to depend on the initial vapor concentration, but not in direct proportion. At TCE vapor concentrations near saturation, the fast fraction comprised the majority of the sorbed TCE and required less than 10 min for desorption, whereas the slow desorbing fraction was released over periods of months to years. Although model solids with uniform pore and particle sizes were used, a pore diffusion model was not adequate to describe both the fast and slow desorbing fractions. The measured physical properties of the solids were not useful for making a priori predictions and, in comparisons among the solids, did not correlate with the amount and the rate of slowly released TCE. The Freundlich isotherm exponents correlated with the fraction of slowly released TCE, but isotherm nonlinearity was not sufficient to account for the dual rate behavior.

Keywords: Aliphatic Halocarbons, Chemicals, Desorption, Diffusion, Kinetics, Sediments, Slowly Reversible Sorption, Soils

? Wagner, J., Chen, H., Brownawell, B.J. and Westall, J.C. (1994), Use of cationic surfactants to modify soil surfaces to promote sorption and retard migration of hydrophobic organic-compounds. *Environmental Science & Technology*, **28** (2), 231-237.

Full Text: [1994\Env Sci Tec28, 231.pdf](1994/Env%20Sci%20Tec28,%20231.pdf)

Abstract: Cationic surfactants can be used to modify surfaces of soils and subsurface materials to promote adsorption of hydrophobic organic compounds (HOC). Batch and column experiments were performed to investigate this phenomenon with the cationic surfactant dodecylpyridinium (DP), a series of chlorobenzenes as representative HOC, and a low organic carbon aquifer material (Lula). The adsorption isotherm of DP was highly nonlinear; at micromolar concentrations, DP was adsorbed strongly but not irreversibly; at millimolar concentrations, adsorption was relatively weak. Distribution ratios of the chlorobenzenes varied nonlinearly with DP loading. The elution of chlorobenzenes from columns packed with DP-treated aquifer material was examined; a transport model based on the results of the batch experiments and the local equilibrium assumption yielded an acceptable approximation for the coelution of DP and HOC from the column. It is concluded that treatment of surfaces with cationic surfactants shows promise as a means of promoting HOC sorption in a variety of treatment processes.

Keywords: Adsorption, Adsorption Isotherm, Batch Experiments, Carbon, Cationic Surfactant, Clay, Contaminants, Equilibrium, Hydrophobic Organic Compounds, Isotherm, Loading, Local, Materials, Model, Organic, Organic Carbon, Organic Compounds, Soils, Sorption, Surfaces, Surfactant, Surfactants, Tetrachloromethane Sorption, Transport, Treatment, Water

Notes: highly cited

? Carroll, K.M., Harkness, M.R., Bracco, A.A. and Balcarcel, R.R. (1994), Application of a permeant/polymer diffusional model to the desorption of polychlorinated biphenyls from Hudson River sediments. *Environmental Science & Technology*, **28** (2), 253-258.

Full Text: [1994\Env Sci Tec28, 253.pdf](1994/Env%20Sci%20Tec28,%20253.pdf)

Abstract: The desorption of polychlorinated biphenyls (PCBs) from Hudson River sediments was examined using XAD-4 resin as a PCB adsorbent. Both a rapidly desorbing labile component and a more slowly desorbing resistant component were observed. The fraction of PCBs in the resistant component was found to be a function of PCB concentration and total organic carbon in the sediment, independent of inorganic particle size. Milling the sediment had no effect on PCB desorption, while pretreatment of the sediment using heat (with and without caustic addition) enhanced the rate of desorption and significantly decreased there distant fraction. We propose that the labile and resistant fractions arise from disparate diffusional rates of PCBs from the swollen and condensed phases of the sediment organic matter. Diffusion coefficients of 2.6×10-18 and 7.3×10-21 cm2/s for PCBs in the condensed and swollen humic polymer are calculated using a permeant/polymer diffusional model, with calculated diffusional distances on the order of 1×10-6 cm.

Keywords: Aliphatic Halocarbons, Aromatic-Hydrocarbons, Carbon, Dechlorination, Desorption, Kinetics, Matter, Molecular-Weight, Organic-Compounds, Sediments, Slowly Reversible Sorption, Soils

? Baughman, G.L. and Weber, E.J. (1994), Transformation of dyes and related compounds in anoxic sediment: Kinetics and products. *Environmental Science & Technology*, **28** (2), 267-276.

Full Text: [1994\Env Sci Tec28, 267.pdf](1994/Env%20Sci%20Tec28,%20267.pdf)

Abstract: The reactions of several azo, anthraquinone, and quinoline dyes were studied in settled sediments. Several 1-substituted anthraquinones were lost from sediment with half-lives less than 10 days. For monosubstituted 1-amino and 1-methylamino (Disperse Red 9) compounds, the most stable product is the intramolecularly hydrogen-bonded anthrone. The 1,4-diaminoanthraquinone (Disperse Violet 1) and 1,4-diamino-2-methoxyanthraquinone (Disperse Red 11) were lost without formation of detectable products except for a demethylation product of the latter. Both the anthrone from Disperse Red 9 and the demethylation product of Disperse Red 11 reacted with half-lives of a few months, but other major products were not detected. An azo dye (Solvent Red 1) and a quinoline dye (Solvent Yellow 33) were transformed with half-lives of a few days and months, respectively. The azo dye reacted by reductive cleavage of the azo bond.

Keywords: Benzidine-Based Dyes, Aromatic-Amines, Aquatic Systems, Disperse Dyes, Water-Systems, Azo Dyes, Fate, Metabolism, Degradation, Solubility

Haggerty, G.M. and Bowman, R.S. (1994), Sorption of chromate and other inorganic anions by organo-zeolite. *Environmental Science & Technology*, **28** (3), 452-458.

Full Text: [E\Env Sci Tec28, 452.pdf](E/Env%20Sci%20Tec28,%20452.pdf)

Abstract: We performed batch sorption experiments that showed a significantly enhanced removal of inorganic oxyanions from aqueous solution by clinoptilolite-dominated zeolite modified by the quaternary amine hexadecyltrimethylammonium (HDTMA). Since HDTMA is too large to enter into the internal portion of the zeolite, sorption of the amine only occurred on the zeolite’s external exchange sites. HDTMA was exchanged with extrastructural cations of the zeolite up to the external cation-exchange capacity. The HDTMA-modified surface was stable when exposed to extremes in pH and ionic strength and to organic solvents. While the natural zeolite had no affinity for the oxyanions, the HDTMA-modified zeolite showed significant removal of chromate, selenate, and sulfate from 0.005 M CaClz aqueous solution. Sorption data for each anion were well-described by the Langmuir isotherm equation. We found that anion sorption was highest when the zeolite was modified such that HDTMA satisfied 100% of its external cation-exchange capacity. The mechanism of anion retention appears to be the formation of an HDTMA-anion precipitate on the zeolite surface.

Xing, B., McGill, W.B., Dudas, M.J., Maham, Y. and Hepler, L. (1994), Sorption of phenol by selected biopolymers: Isotherms, energetics, and polarity. *Environmental Science & Technology*, **28** (3), 466-473.

Full Text: [E\Env Sci Tec28, 466.pdf](E/Env%20Sci%20Tec28,%20466.pdf)

Abstract: The behavior of phenol in the terrestrial environment is strongly regulated by its reaction with soil components. We report here on the uptake of phenol by soil minerals (goethite, kaolinite, and montmorillonite) and by organics that may occur naturally in or be added to soil (two lignins, chitin, cellulose, collagen, and activated carbon). Our objectives were to determine the energetics and capacity for their uptake of phenol using batch equilibration, calorimetry, and CPMAS 13C NMR and to evaluate the relation of organic carbon referenced sorption coefficient *(KO,)* with the polarity of biopolymers. The biopolymers sorbed 2-45-fold more phenol than did the minerals. The *Kd* for phenol uptake by lignins with high aromaticity and low polarity were 4-6.5-fold higher than that for chitin and 13-22-fold higher than that for cellulose. Energy released during the formation of a putative donor-acceptor complex on activated carbon was about 30 kJ/mol. Energy released for sorption of phenol by biopolymers ranged from 5 to 20 kJ/mol. The *KO,* of phenol decreased with increasing polarity: (N + O)/C of the biopolymers. We infer that the *KO,* of organic compounds may not be adequately predicted from their *K,* without considering the nature of organic matter.

? Carter, M.C. and Weber, Jr., W.J. (1994), Modeling adsorption of TCE by activated carbon preloaded by background organic-matter. *Environmental Science & Technology*, **28** (4), 614-623.

Full Text: [1994\Env Sci Tec28, 614.pdf](1994/Env%20Sci%20Tec28,%20614.pdf)

Abstract: Experiments with a natural water and a synthetic water were conducted to investigate systematically the effects of preloading of activated carbon by background organic matter on the subsequent adsorption of trichloroethylene (TCE). Equilibrium capacities and rates of adsorption were both found to decrease with increased periods of continuous preloading by both background waters. The effect of preloading by the natural water was observed to level off after several weeks. A pore diffusion model calibrated with adsorption parameters measured under different controlled conditions was used to predict fixed-bed adsorber breakthrough behavior. The modeling results indicated that equilibrium and rate parameters may need to be varied with preloading time to accurately predict target compound breakthrough for systems which undergo extensive preloading. A constant parameter approach appears adequate if preloading effects are small, or if the operating time of an adsorber is very long.

Keywords: Activated Carbon, Adsorption, Fixed-Bed Adsorbers, Gac, Humic Substances, Mass-Transfer Parameters, Mixtures, Organic Matter, Polymaleic Acid, Prediction, Soil Fulvic-Acid, Sorption, Tce, Transport, Trichloroethylene

Fängmark, I., Strömberg, B., Berge, N. and Rappe, C. (1994), Influence of postcombustion temperature profiles on the formation of PCDDs, PCDFs, PCBzs, and PCBs in a pilot incinerator. *Environmental Science & Technology*, **28** (4), 624-629.

Full Text: [E\Env Sci Tec28, 624.pdf](E/Env%20Sci%20Tec28,%20624.pdf)

Abstract: A laboratory-scale fluidized-bed reactor fueled by a synthetic waste was used to study the influence of the flue gas temperature profile after the combustor on the formation of chlorinated aromatic compounds. An experimental plan of full factorial design involving the variables temperature and residence time was chosen for the experiments. Flue gas samples with residence time in the cooling section of the reactor between 0.9 and 2.9 s were collected at temperatures between 260 and 510°C. Response surface models describing the formation of toxic equivalents of polychlorinated dibenzo-p-dioxins, dibenzofurans, and benzenes as a function of temperature and residence time were constructed from the analytical results. The samples were also analyzed for non-ortho-polychlorinated biphenyls. The results show that all the above compounds exhibit a similar dependency on temperature and residence time. The highest levels were obtained at 340°C and 2.9-s residence time, and the lowest levels were obtained under conditions of rapid quenching of the flue gas temperature to 260°C.

Keywords: Optimizing Dioxin Emission, Post-Furnace Formation, Dibenzo-Para-Dioxins, Waste Incineration, Fly-Ash, Combustion System, Synthetic Refuse, Decomposition, PCDD/PCDF

Notes: highly cited

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Full Text: [1994\Env Sci Tec28, 859.pdf](1994/Env%20Sci%20Tec28,%20859.pdf)

Abstract: Adsorption and desorption of pollutants to soil and sediment materials are major fate mechanisms. The hypothesis that adsorption and desorption are reversible processes has been tested. The organic pollutants naphthalene, phenanthrene, and p-dichlorobenzene have been studied in the laboratory using batch reactors at room temperature from a few hours to over 2 months. The adsorption experiments were at equilibrium within 1-4 days and could be modeled using simple linear isotherms with K(p) values consistent with published K(oc) and K(ow) relationships. Desorption experiments were conducted with the contaminated sediments by successive dilutions. Desorption experiments varied from 1 day to 5 months, and observed desorption rates were from 1 to 3 orders of magnitude smaller than previously measured or predicted. If equilibrium were obtained during the desorption, typically over 82-99% of the adsorbed pollutant would have been desorbed, but generally only 30-50% of the adsorbed pollutant could be desorbed. These desorption results could not be explained by commonly invoked kinetic models or artifacts of the procedure. The possibility and consequences of such adsorption and desorption behavior being the result of either hysteresis or irreversible adsorption is discussed.

Keywords: Adsorption, Aliphatic Halocarbons, Aquifer Materials, Chemicals, Desorption, Equilibrium, Hydrophobic Contaminants, Isotherms, Long-Term Sorption, Naphthalene, Natural Sediments, Sediments, Slowly Reversible Sorption, Systems, Transport

Nederlof, M.M., van Riemsdijk, W.H. and Koopal, L.K. (1994), Heterogeneity analysis for binding data using an adapted smoothing spline techniqe. *Environmental Science & Technology*, **28** (6), 1037-1047.

Full Text: [E\Env Sci Tec28, 1037.pdf](E/Env%20Sci%20Tec28,%201037.pdf)

Abstract: Heterogeneity analysis is a helpful tool to select a proper model for the description of ion binding to polyfunctional ligands. Two approaches of heterogeneity analysis are discussed: the local isotherm approximation (LIA) method and the differential equilibrium function (DEF) method. For both methods, the approximate distribution function of a given ligand system is a series of derivatives of the experimentally obtained binding function. To obtain reliable derivatives, a smoothing spline routine is adapted for the present problem. The smoothing parameter of the spline is determined by a generalized cross-validation criterion in combination with physical constraints derived from the binding function. With the thus obtained spline function, the distribution is calculated. Error bars for the obtained distribution function can be calculated using the variance in the spline function. The error bars indicate whether peaks in the distribution are significant. The methodology ia applied to a synthetic data set to illustrate its capabilities and limitations and is applied to copper binding to humic materials (data set of Hansen et al.) to illustrate its use in practice. The quality of the calculated distribution function depends on the experimental error in the data, the number of data points, and the binding range. On the basis of the calculated distribution function, a binding model can be selected.

Keywords: Adsorption Energy-Distribution, Metal Humate Interactions, Humic Substances, Affinity Distributions, Fulvic-Acid, Surface Heterogeneity, Proton Binding, Ligand, Models, Complexation

Grossl, P.R., Sparks, D.L. and Ainsworth, C.C. (1994), Rapid kinetics of Cu(II) adsorption/desorption on Goethite. *Environmental Science & Technology*, **28** (8), 1422-1429.

Full Text: [E\Env Sci Tec28, 1422.pdf](E/Env%20Sci%20Tec28,%201422.pdf)

Abstract: The kinetics of Cu2+ adsorption/desorption on goethite (α-FeOOH) was evaluated using the pressure-jump (p-jump) relaxation technique. This technique provides kinetic and mechanistic information for reactions occurring on millisecond time scales. A double relaxation event was observed for Cu2+ adsorption/desorption on goethite. The rate of these relaxations (r) decreased with an increase in pH, along the adsorption edge. The mechanism ascribed to the relaxations is the formation of a monodentate inner-sphere Cu2+/goethite surface complex. The calculated intrinsic rate constant for adsorption (k1’int) was 10 (6.81) L mol-1s-1 and was about 2 orders of magnitude larger than the intrinsic rate constant for desorption (k-1’int = 10 (4.88) L mol-1s-1). Using results from this study and others, it was established that the rate of adsorption of divalent metal cations on goethite was directly related to the rate of removal of a water molecule from the primary hydration sphere of a particular divalent metal cation.

Notes: highly cited

Xu, Y.P., Schwartz, F.W. and Traina, S.J. (1994), Sorption of Zn2+ and Cd2+ on hydroxyapatite surface. *Environmental Science & Technology*, **28** (8), 1472-1480.

Full Text: [E\Env Sci Tec28, 1472.pdf](E/Env%20Sci%20Tec28,%201472.pdf)

Abstract: This study examines the mechanisms and kinetics of Zn2+ and Cd2+ sorption onto hydroxyaPatite surfaces. The concentrations of Zn2+ and Cd2+ in the study range from 0 to 2.5 mmol/L. Although the sorption data follow Langmuir isotherms, a detailed examination reveals that surface complexation and coprecipitation are the most important mechanisms with possibly ion exchange and solid diffusion also contributing to the overall sorption process. pH-controlled experiments point to significant deprotonation of hydroxyapatite surface and sorption by metal complexation with surface functional groups such as = POH. The major metal surface species are likely to be = POZn+ and = POCd+. The coprecipitation of Zn2+ and Cd2+ with Ca to hydroxyapatite is implied by significant changes in Ca and phosphate concentrations during the metal sorption processes. Cd2+ coprecipitation appears to be more significant than Zn2+ coprecipitation. Desorption data for the metals suggest that Zn2+ is held more strongly than Cd2+ on the mineral surfaces. The observation is mainly interpreted as a result of redissolution of the coprecipitates because of more Cd coprecipitate than Zn coprecipitate. Solid diffusion of the metals into the mineral interior may also contribute to the desorption results because Zn diffusion is promoted by a much smaller size and ionic radius of Zn2+.

Keywords: Inorganic Cation-Exchangers, Lattice-Constant Measurements, Synthetic Hydroxyapatites, Solid-Solutions, Ion-Exchange, Calcite, Adsorption, Cadmium, Copper, Crystallization

Notes: highly cited

? Chin, Y.P., Aiken, G. and O’loughlin, E. (1994), Molecular-weight, polydispersity, and spectroscopic properties of aquatic humic substances. *Environmental Science & Technology*, **28** (11), 1853-1858.

Full Text: [1994\Env Sci Tec28, 1853.pdf](1994/Env%20Sci%20Tec28,%201853.pdf)

Abstract: The number- and weight-averaged molecular weights of a number of aquatic fulvic acids, a commercial humic acid, and unfractionated organic matter from four natural water samples were measured by high-pressure size exclusion chromatography (HPSEC). Molecular weights determined in this manner compared favorably with those values reported in the literature. Both recent literature values and our data indicate that these substances are smaller and less polydisperse than previously believed. Moreover, the molecular weights of the organic matter from three of the four natural water samples compared favorably to the fulvic acid samples extracted from similar environments. Bulk spectroscopic properties of the fulvic substances such as molar absorptivity at 280 nm and the E(4)/E(6) ratio were also measured. A strong correlation was observed between molar absorptivity, total aromaticity, and the weight average molecular weights of all the humic substances. This observation suggests that bulk spectroscopic properties can be used to quickly estimate the size of humic substances and their aromatic contents. Both parameters are important with respect to understanding humic substance mobility and their propensity to react with both organic and inorganic pollutants.

Keywords: Dissolved Organic-Matter, Polycyclic Aromatic-Hydrocarbons, Macroporous Resins, Fulvic-Acids, Binding, Water, Chromatography, Sediments, Seawater, Colloids

Crist, R.H., Martin, J.R., Carr, D., Watson, J.R., Clarke, H.J. and Crist, D.R. (1994), Interaction of metals and protons with algae. 4. Ion exchange vs adsorption models and a reassessment of scatchard plots, ion-exchange rates and equilibria compared with calcium alginate. *Environmental Science & Technology*, **28** (11), 1859-1866.

Full Text: [E\Env Sci Tec28, 1859.pdf](E/Env%20Sci%20Tec28,%201859.pdf)

Abstract: Sorption is frequently described in terms of adsorption isotherms (Langmuir, Freundlich), but metal sorption on algae has been recognized to be an *exchange* process where sorption is accompanied by the release of ions. An experimental ion-exchange constant for Zn displacing Ca from *Rhizoclonium* was used to calculate concentrations over a wide enough range to assess interpretations given to Langmuir and Scatchard plots. While such plots may be convenient to describe maximum sorption and systematize data, misinterpretations can occur at low metal concentrations in an ion-exchange system. Values of Ke, for seven metals displacing Ca from *Vaucheria* correlated with formation constants of the metal acetates and with *K,,* of the metals on calcium alginate, a model of cell wall components, indicating the bonding of metals to carboxylate groups of algal cell walls. Rates of metal desorption from *Vaucheria* by EDTA-Li are inversely related to binding strengths, and rates of Cd desorption from calcium alginate justify assumptions in the K,, expression. Removal of Cd with a calcium alginate column was investigated for possible application to water treatment.

? Nayyar, S.P., Sabatini, D.A. and Harwell, J.H. (1994), Surfactant adsolubilization and modified admicellar sorption of nonpolar, polar, and ionizable organic contaminants. *Environmental Science & Technology*, **28** (11), 1874-1881.

Full Text: [1994\Env Sci Tec28, 1874.pdf](1994/Env%20Sci%20Tec28,%201874.pdf)

Abstract: Adsolubilization of contaminants by media-sorbed surfactants is an important phenomenon for surfactant-based environmental technologies. The present research evaluates the impacts of contaminant properties on adsolubilization (e.g., nonpolar, polar, and ionizable organic compounds). In addition, adsolubilization by modified admicelles is investigated (operating below the surfactant’s Krafft temperature). The medium and surfactant investigated were alumina and sodium dodecyl sulfate, respectively. Naphthalene, naphthol, and 4-amino-1-naphthalenesulfonic acid were investigated as nonpolar, polar, and ionizable organic compounds, respectively. Variations in adsolubilization results for these compounds are explained based on surfactant fundamentals and contaminant properties. Modified admicelles effectively adsolubilized organic molecules without requiring the presence of surfactant monomers. Implications of these results to surfactant-based environmental technologies are discussed.

Keywords: Alumina, Bilayers, Contaminants, Enhanced Solubilization, Environmental, Impacts, Organic, Organic Compounds, Organic Molecules, Polymerization, Properties, Research, Residual Dodecane, Separation, Sodium, Soil Columns, Solvents, Subsurface Remediation, Sulfate, Surfactant, Surfactants, Temperature, Water

Notes: highly cited

Matheson, L.J. and Tratnyek, P.G. (1994), Reductive dehalogenation of chlorinated methanes by iron metal. *Environmental Science & Technology*, **28** (12), 2045-2053.

Full Text: [E\Env Sci Tec28, 2045.pdf](E/Env%20Sci%20Tec28,%202045.pdf)

Abstract: Reduction of chlorinated solvents by fine-grained iron metal was studied in well-mixed anaerobic batch systems in order to help assess the utility of this reaction in remediation of contaminated groundwater. Iron sequentially dehalogenates carbon tetrachloride via chloroform to Methylene chloride. The initial rate of each reaction step was pseudo-first-order in substrate and became substantially slower with each dehalogenation step. Thus, carbon tetrachloride degradation typically occurred in several hours, but no significant reduction of Methylene chloride was observed over 1 month. Trichloroethene (TCE) was also dechlorinated by iron, although more slowly than carbon tetrachloride. Increasing the clean surface area of iron greatly increased the rate of carbon tetrachloride dehalogenation, whereas increasing pH decreased the reduction rate slightly. The reduction of chlorinated methanes in batch model systems appears to be coupled with oxidative dissolution (corrosion) of the iron through a largely diffusion-limited surface reaction.

Keywords: Adsorption, Carbon, Carbon-Tetrachloride, Column, Dechlorination, Degradation, Dissolution, Electron-Transfer, Ethanes, Groundwater, Halocarbons, Iron, Metal, Model, pH, Reduction, Remediation, Sulfide, Surface Area, Surfaces, Water

Young, T.M. and Weber, Jr., W.J. (1995), A distributed reactivity model for sorption by soils and sediments. 3. Effects of diagenetic processes on sorption energetics. *Environmental Science & Technology*, **29** (1), 92-97.

Full Text: [E\Env Sci Tec29, 92.pdf](E/Env%20Sci%20Tec29,%2092.pdf)

Abstract: lsosteric heats of phenanthrene sorption were calculated from isotherms measured at different temperatures on three natural soil materials having organic carbon fractions subjected to varying degrees of diagenetic alteration. The isotherms were highly nonlinear, and the sorption process became less exothermic with increased solid-phase loading. These observations are consistent with a classical surface adsorption reaction. However, isosteric heat values calculated using a pure supercooled solute standard state (-16.3 to f25.5 kJ/mol) were less exothermic than expected for a surface adsorption process and least exothermic for the sorbent having the highest sorption capacity. A model capable of reconciling these seemingly divergent observations envisions natural organic matter as a macromolecule that is gradually transformed by diagenetic processes from a loose, amorphous structure (e.g., fulvic acid) to one that is increasingly condensed and ultimately highly microcrystalline in extremely old organic matter (e.!., anthracite coal). The model provides a consistent basis for explaining the observed isosteric heat values and changes in isotherm I i n ea rity and org a ni c c a rbon -nor m a lized sorption capacities with increased diagenesis.

Keywords: Adsorption, Adsorption-Desorption, Aquifer Materials, Chemicals, Equilibria, Ionic Organic-Compounds, Matter, Mixtures, Natural Organic Matter, Organic Matter, Phenanthrene, Polynuclear Aromatic-Hydrocarbons, Soils, Sorption, Water

Johnson, C.A., Brandenberger, S. and Baccini, P. (1995), Acid neutralizing capacity of municipal waste incinerator bottom ash. *Environmental Science & Technology*, **29** (1), 142-147.

Full Text: [E\Env Sci Tec29, 142.pdf](E/Env%20Sci%20Tec29,%20142.pdf)

Abstract: One of the main concerns in relation to municipal solid waste incinerator (MSWI) bottom ash is the longterm mobility of heavy metals, which depends on leachate pH and thus on the acid neutralizing capacity of MSWI bottom ash. The acid neutralizing capacity is determined by titration. Independent of titration methodology, MSWI bottom ash appears to be predominantly buffered by Ca minerals. In alkaline conditions, calcium hydroxides/silicates and CaCO3 dominate the solution chemistry of the aqueous phase. They constitute the acid neutralizing capacity (ANC) equivalent to the titration end point at pH 7.5. Fresh samples have an ANC(7.5) of 1.2-1.7±0.05 mequiv/g. In neutral to acid conditions, silicate dissolution becomes increasingly important. Calcium carbonate is the predominant component of ANC(7.5) in samples aged in landfills or forest track coffers. Determined ANC(7.5) values of the aged samples range between 0.6 and 1.0±0.05 mequiv/g. Intrinsic neutralization reactions with CO2 or silica are the most probable explanations for the absence of the basic calcium hydroxide/silicate components.

Gonzalez-Davila, M., Santana-Casiano, J.M., Perez-Peña, J. and Millero, F.J. (1995), Binding of Cu(II) to the surface and exudates of the alga *Dunaliella tertiolecta* in seawater. *Environmental Science & Technology*, **29** (2), 289-301.

Full Text: [E\Env Sci Tec29, 289.pdf](E/Env%20Sci%20Tec29,%20289.pdf)

Abstract: The adsorption process and the organic matter interaction between the marine phytoplankton specie Dunaliella tertiolecta and copper ions were investigated by differential pulse anodic stripping voltammetry. Suspensions of living algae in natural Gran Canaria (Islas Canarias) seawater were titrated with Cu(II) as a function of pH, temperature, and salinity. The acid-base properties of the surface of the alga in a 0.7 M NaCl solution were characterized and interpreted as if the surface contained carboxylic acid groups (pK(a, 1) = 4.92±0.16) and amino groups (pK(a, 2) = 6.28±0.09, pK(a, 3) = 10.06±0.10). The binding constant for the weaker ligands of the Gran Canaria seawater increased from 8.60±0.03 to 9.30±0.12 when 2.2×107 cell L-1 was added to 0.45 µm filtered seawater. The rate of uptake was found to occur in two steps. The adsorption equilibrium data correlate well with a two-site model which considers the algal surface as one which possesses two major functional groups: high-affinity binding and low-affinity binding. The high-affinity constant was of the same order of magnitude as the complexing capacity of the exudates excreted by the algae, showing that extracellular ligands play an important role in decreasing the concentration of the free metal concentration. Changes in the temperature, salinity, and pH of the seawater solution modified both the adsorption of metal and the amount of complexed copper.

Keywords: Diatom Thalassiosira-Weissflogii, Anodic-Stripping Voltammetry, Copper Complexing Capacity, Phaeodactylum-Tricornutum, Marine-Phytoplankton, *Chlorella-Vulgaris*, Organic-Ligands, Natural-Waters, Heavy-Metals, Ion-Exchange

Benedetti, M.F., Milne, C.J., Kinniburgh, D.G., van Riemsdijk, W.H. and Koopal, L. (1995), Metal ion binding to humic substances: Application of the non-ideal competitive adsorption model. *Environmental Science & Technology*, **29** (2), 446-457.

Full Text: [E\Env Sci Tec29, 446.pdf](E/Env%20Sci%20Tec29,%20446.pdf)

Abstract: The application of a new model to describe metal ion binding by humic acids is discussed. Metal ion binding is always of a competitive nature since the proton is always present. Although of great practical importance, the combination of a chemically heterogeneous system with competitive binding poses difficult problems from both experimental and theoretical points of view. The new Non-ideal Competitive Adsorption model (NICA model) used here is able to account for the non-ideal binding to heterogeneous ligands. A good description of the binding of H, Ca, Cd, and Cu to a purified peat humic acid is achieved over a wide range of free metal ion concentrations (-2 > log Me2+ >-14) and pH (2 < pH < 10). The results show that binding of metal ions to humic acid is strongly influenced by the intrinsic chemical heterogeneity of the humic material itself as well as by ion-specific non-ideality. The results indicate that copper competes much more efficiently with protons bound to the phenolic type groups than calcium and cadmium.

Keywords: Unified Physicochemical Description, Poly-Electrolyte Properties, Dissolved Organic-Matter, Fulvic-Acids, Proton Binding, Complexation Equilibria, Selective Electrode, Statistical-Model, Natural-Waters, Cation Binding

Notes: highly cited

? Hatzinger, P.B. and Alexander, M. (1995), Effect of aging of chemicals in soil on their biodegradability and extractability. *Environmental Science & Technology*, **29** (2), 537-545.

Full Text: [1995\Env Sci Tec29, 537.pdf](1995/Env%20Sci%20Tec29,%20537.pdf)

Abstract: A study was conducted to determine whether the time that a compound remains in a soil affects its biodegradability and the ease of its extraction. Phenanthrene and 4-nitrophenol were aged in sterilized loam and muck, and bacteria able tb degrade the compounds were then added to the soils. Increasingly smaller amounts of phenanthrene in the muck and 4-nitrophenol in both soils were mineralized with increasing duration of aging. Aging also increased the resistance of phenanthrene to biodegradation in nutrient-amended aquifer sand. The rate of mineralization of the two compounds in both soils declined with increasing periods of aging. The amount of phenanthrene and 4-nitrophenol added to sterile soils that was recovered by butanol extraction declined with duration of aging, but subsequent Soxhlet extraction recovered phenanthrene from the loam but not the muck. The extents of mineralization of phenanthrene previously incubated for up to 27 days with soluble or insoluble organic matter from the muck were similar, less aged than freshly added phenanthrene was biodegraded if aggregates in the muck were sonically disrupted. The data show that phenanthrene and 4-nitrophenol added to soil become increasingly more resistant with time to biodegradation and extraction.

Keywords: Slowly Reversible Sorption, Organic-Compounds, Nonequilibrium Sorption, Aliphatic Halocarbons, Desorption-Kinetics, Substituted Phenols, Adsorption, Diffusion, Field, Fractions

Lin, C.F. and Hsi, H.C. (1995), Resource recovery of waste fly-ash - synthesis of zeolite-like materials. *Environmental Science & Technology*, **29** (4), 1109-1117.

Full Text: [E\Env Sci Tec29, 1109.pdf](E/Env%20Sci%20Tec29,%201109.pdf)

Abstract: Since the main components of fly ash are SiO2 and Al2O3, which exhibit a similar chemical structure of zeolite, fly ash was used in this study to synthesize zeolite-like materials. Different hydrothermal conditions were evaluated for achieving a maximum cation-exchange capacity of the synthesized zeolites. Experimental parameters included temperature, nature and molarity of caustic reagents, pressure, and reaction time. Tasks performed in this work included phase identification of treated fly ash by X-ray diffraction techniques, measurement of cation-exchange capacity and specific surface area of the synthesized zeolites, determination of elemental composition, and evaluation of metal adsorption onto the synthesized zeolites. Four zeolites were identified under Various experimental conditions: zeolite P (2-4 N NaOH at 70-130°C) analcime (2 N NaOH between 130 and 170°C), hydroxy sodalite (4-10 N NaOH at 90-200°C), and cancrinite (T > 200°C). After NaOH treatment, there was a significant reduction in Si content, while Na increased as the reaction temperature or the strength of NaOH increased. The experimental conditions at 2 N NaOH, 110°C, and 3.45 MPa for 1-day reaction resulted in treated fly ash with a cation-exchange capacity of 210 mequiv, 100 g. Treated fly ash exhibited a strong affinity far Cu and Cd metal ions. At pH = 6, approximately 90% of Cu and 80% of Cd were removed by the zeolites synthesized under different conditions.

Keywords: Adsorption, Cation Exchange, Zeolite, Zeolites

? Dushenkov, V., Kumar, P.B.A.N., Motto, H. and Raskin, I. (1995), Rhizofiltration: The use of plants to remove heavy-metals from aqueous streams. *Environmental Science & Technology*, **29** (5), 1239-1245.

Full Text: [1995\Env Sci Tec29, 1239.pdf](1995/Env%20Sci%20Tec29,%201239.pdf)

Abstract: Heavy metal pollution of water is a major environmental problem facing the modern world. Rhizofiltration-the use of plant roots to remove heavy metals from water-is an emerging environmental cleanup technology. Roots of many hydroponically grown terrestrial plants, e.g., Indian mustard (Brassica juncea (L.) Czern.), sunflower (Helianthus annuus L.), and various grasses, effectively removed toxic metals such as Cu2+, Cd2+, Cr6+, Ni2+, Pb2+, and Zn2+ from aqueous solutions. Roots of B. juncea concentrated these metals 131-563-fold (on a DW basis) above initial solution concentrations. Pb removal was based on tissue absorption and on root-mediated Pb precipitation in the form of insoluble inorganic compounds, mainly lead phosphate. At high Pb concentrations, precipitation played a progressively more important role in Pb removal than tissue absorption, which saturated at approximately 100 mg of Pb/g DW root. Dried roots were much less effective than live roots in accumulating Pb and in removing Pb from the solution.

Keywords: Water, Accumulation, Duckweed, Copper, Acid

Papelis, C. (1995), X-ray photoelectron spectroscopic studies of cadmium and selenite adsorption on aluminum oxides. *Environmental Science & Technology*, **29** (6), 1526-1533.

Full Text: [E\Env Sci Tec29, 1526.pdf](E/Env%20Sci%20Tec29,%201526.pdf)

Abstract: The sorption of cadmium(II) and selenite on two porous, high surface area aluminum oxides and a nonporous crystalline aluminum oxide (alpha-Al2O3, corundum) was studied by X-ray photoelectron spectroscopy (XPS). The porous adsorbents used (ALCOA types CP-5 and C-33) had different sizes and pore structure but otherwise had similar characteristics. CP-5 particles were smaller than C-33 and partly microporous, C-33 particles were mesoporous and more crystalline than the CP-5 particles. The total aqueous concentrations of cadmium(II) and selenite were 1.0×10-4 and 1.0×10-3 M, respectively. Maximum surface coverages of the porous adsorbents, as estimated by XPS, were 0.8 and 0.5 monolayers for cadmium(II) and selenite, respectively. XPS estimates of cadmium and selenite surface coverages agreed well with the hypothesis that adsorbate intraparticle diffusion followed by sorption is the predominant mechanism of cadmium and selenite uptake by porous aluminas under these experimental conditions. XPS results of cadmium and selenite sorption on corundum agreed well with expected surface coverages, based on sorption isotherm data. These results have significant implications for the fate and transport of trace elements in the environment and the remediation of wastewaters and contaminated groundwaters.

Keywords: Dissolved Organic-Compounds, Surface Characterization, Activated Alumina, Porous Aluminas, Gamma-Alumina, Catalysts, XPS, Silica, Cobalt, Precipitation

Singer, A. and Berkgaut, V. (1995), Cation exchange properties of hydrothermally treated coal fly ash. *Environmental Science & Technology*, **29** (7), 1748-1753.

Full Text: [E\Env Sci Tec29, 1748.pdf](E/Env%20Sci%20Tec29,%201748.pdf)

Abstract: Two samples of fly ash were treated for 2-48 h in 3.5 M NaOH at 100°C. Powder XRD patterns of resulting products were obtained and their CEC was determined. Zeolite P and/or hydroxysodalite formed during the treatment from the glassy part of fly ash, while quartz gradually dissolved and mullite remained stable. Approximately 50% of fly ash could be converted to zeolites with the CEC of resulting products reaching 2.5-3 mequiv/g. Concentrations of extractable B, Mo and Se in fly ash considerably decreased upon treatment. Adsorption isotherms of lead on treated fly ash suggested that at low initial lead concentrations and at pH lower than 6 precipitation of lead compounds is not likely. A desorption experiment indicated ii incomplete reversibility at higher concentrations, suggesting that part of the adsorption may not have been cation exchange related. Treated fly ash displayed high selectivity for Pb2+ > Sr2+ > Cu2+ > Cd2+ > Zn2+ > Cs+ in competition with Na+, especially at low concentrations of these cations and was effective in removing Pb and Zn from industrial wastewaters. It was not selective for Ni2+ and UO22+. In a column test, 160 bed vols of NH4+-contaminated fish-pond water was filtered through treated fly ash until NH4+ breakthrough occurred.

Keywords: Soils, Adsorption, pH, Cd

? Carter, M.C., Kilduff, J.E. and Weber, Jr., W.J. (1995), Site energy-distribution analysis of preloaded adsorbents. *Environmental Science & Technology*, **29** (7), 1773-1780.

Full Text: [1995\Env Sci Tec29, 1773.pdf](1995/Env%20Sci%20Tec29,%201773.pdf)

Abstract: A methodology relating changes in the isotherm parameters for sorption of one solute by a heterogeneous sorbent to changes in the site energy distributions of that sorbent caused by prior irreversible sorption (preloading) of other solutes is proposed. Approximate site energy distributions underlying three isotherm models commonly used to describe sorption of organic solutes from aqueous solutions are developed using the theory of heterogeneous surfaces. It is demonstrated that, regardless of the type of initial site energy distribution assumed, preloading by a non-desorbable solute results in a loss of surface heterogeneity. The loss occurs preferentially across sites having the highest energies, with the number of sites in the lowest energy ranges actually increasing in some cases. Activated carbon is used to demonstrate the methodology, but the approach is generally applicable to other heterogeneous,adsorbents in both natural and engineered systems.

Keywords: Adsorption-Isotherm, GAC, Heterogeneous Surfaces, Organic-Matter, Site Energy Distribution, Solids, Sorption

Notes: highly cited

? Scott, M.J. and Morgan, J.J. (1995), Reactions at oxide surfaces. 1. Oxidation of As(III) by synthetic birnessite. *Environmental Science & Technology*, **29** (8), 1898-1905.

Full Text: [1995\Env Sci Tec29, 1898.pdf](1995/Env%20Sci%20Tec29,%201898.pdf)

Abstract: The rates and mechanisms of the reactions between aqueous As(III) and synthetic birnessite (delta-MnO2) particles were studied. The experimental results at pH 4 indicate that the depletion of As(III) from solution is rapid, with a time scare of minutes. The oxidation product As(V) is released almost as quickly, while the release of the reduction product Mn(II) is slightly slower. The results also show that the concentration of dissolved oxygen has no effect on the rate of reaction. These observations suggest that (i) birnessite directly oxidizes As(III) through a surface mechanism, (II) the adsorption of As(III) is the slowest step in the production of As(V), and (iii) the reaction products As(V) and Mn(II) are released via different mechanisms. The time-dependent behavior of the aqueous reactants and products over a pH range from 4 to 8.2, and a temperature range from 15 to 35 degrees C is also discussed. The rates of As(III) oxidation by inorganic redox reactions with manganese dioxides are compared to observed As(III) oxidation rates in natural aquatic systems.

Keywords: Adsorption, Arsenite, Iron, Kinetics, Manganese-Dioxide, Particles, pH, Reductive Dissolution, Sediments, Sorption, Water

Buffle, J. and Leppard, G.G. (1995), Characterization of aquatic colloids and macromolecules. 1. Structure and behavior of colloidal material. *Environmental Science & Technology*, **29** (9), 2169-2175.

Full Text: [E\Env Sci Tec29, 2169.pdf](E/Env%20Sci%20Tec29,%202169.pdf)

Abstarct: Parts 1 and 2 of this series are tutorial feature articles exceptionally published as Critical Reviews for editorial reasons. They intend to give to the nonspecialist an overview of the major aspects of the characterization of aquatic colloids in perspective of their properties. For this reason, there is a close link between parts 1 and 2, which in reality form one single paper. In these papers, the words colloids and macromolecules refer to any organic or inorganic entity in the size range of 1 nm to 1 pm. In aquatic systems, they form inherently unstable suspensions due to their propensity to undergo conformational changes, aggregate, and then sediment. These factors should be considered carefully in the development of any procedure for the characterization of colloidal material. In this context, part 1 of this series describes the chemical composition and morphology of aquatic colloids and their aggregates, their size distribution, and the main factors that influence the aggregate structure and formation kinetics. Emphasis is placed on structure-behavior relationships of the colloidal material of surface waters. Part 2 discusses some commonly used characterization procedures on the basis of the above properties.

Banerjee, K., Cheremisinoff, P.N. and Cheng, S.L. (1995), Sorption of organic contaminants by fly ash in a single solute system. *Environmental Science & Technology*, **29** (9), 2243-2251.

Full Text: [E\Env Sci Tec29, 2243.pdf](E/Env%20Sci%20Tec29,%202243.pdf)

Abstract: A treatment process is developed using fly ash as a sorbent material to isolate/immobilize organic contaminants from aqueous solution. Batch as well as dynamic studies were conducted during the investigation. The results of this research demonstrate that fly ash has a significant capacity for adsorption of organic compounds from the aqueous solution. The carbon content of fly ash plays a significant role during the sorption process. A significant correlation was observed between the Freundlich sorption capacity parameter and various properties of the organic contaminant such as molar volume, parachor, octanol-water partition coefficient, and electronic polarizability. The sorption of organic compounds onto fly ash is believed to occur principally via the weak induction forces of London or dispersion forces, which are characteristic of the physical adsorption process.

Jakob, A., Stucki, S. and Kuhn, P. (1995), Evaporation of heavy-metals during the heat treatment of municipal solid-waste incinerator fly-ash. *Environmental Science & Technology*, **29** (9), 2429-2436.

Full Text: [E\Env Sci Tec29, 2429.pdf](E/Env%20Sci%20Tec29,%202429.pdf)

Abstract: Thermal treatment is a promising way for the decontamination and inertization of residues from waste incineration. The evaporation of heavy metals thereby is of great significance. It is the goal of this work to investigate the fundamental aspects of the evaporation of heavy metals in the heat treatment process and to determine the process parameters leading to complete evaporation of the relevant heavy metals. Evaporation experiments in different atmospheres were carried out with filter ash from municipal solid waste incineration. The quantities of the heavy metals Zn, Pb, Cd, and Cu evaporated as a function of time were measured at temperatures between 670 and 1300°C, evaporation turned out to be most effective at temperatures just below the melting range of the residue (i.e., at 1000-1100°C) and decreased drastically above this temperature range. The amounts of evaporation (relative to the contents in untreated filter ash) at about 1100°C were 98-100% of Pb, Cd, and Cu and 50% of Zn in air and 98-100% of Pb, Cd, and Zn and 10% of Cu in argon atmosphere, respectively. Results of experiments using model systems indicate that the decre ase in the Zn evaporation at high temperatures is caused by the formation of compounds like Zn2SiO4 and ZnAl2O4. The results of the experiments in argon atmosphere are explained thermodynamically by the reductive potential of the carbon, contained in the residue.

Guibal, E., Roulph, C. and Le Cloirec, P. (1995), Infrared spectroscopic study of uranyl biosorption by fungal biomass and materials of biological origin. *Environmental Science & Technology*, **29** (10), 2496-2503.

Full Text: [E\Env Sci Tec29, 2496.pdf](E/Env%20Sci%20Tec29,%202496.pdf)

Abstract: Metal ion biosorption has been well studied, but the nature of the interactions between metal ions and biomass is still controversial. This paper deals with a description of the influence of pH and sorbent on the removal of uranyl in solution. Infrared spectroscopy allows the influence of amino functions to be characterized for various fungal biomasses such as *Aspergillus niger*, *Penicillium chrysogenum*, or Mucor miehei. The binding of uranyl to amine sites confers that it has a structure similar to that of amide. Metal ion sorption is thus examined through its effects on the amide bands. Uranyl sorption changes the relative intensities of the amine or amide bands. Moreover, the UO vibration band appears at a wavenumber that varies according to the pH and the nature of the metal ion species in the solution. As the cell wall, which mainly consists of chitosan or glycoprotein fibers, has been identified as the major site of metal accumulation, the sorption of uranyl by chitosan is studied by spectroscopic studies, Observed differences are explained by the influence of several functional groups in the fungal biomass. The complexation of uranyl by amino ligands such as the monomeric units present in chitin or chitosan (i.e., acetylglucosamine or glucosamine) is governed by the pH.

Keywords: Biosorption, Chitosan, Influence of pH, Ions, Mechanism, Metal, Metal Ion, *Rhizopus-arrhizus*, Sorption, Uranium Biosorption

Notes: highly cited

? Alexander, M. (1995), How toxic are toxic chemicals in soil? *Environmental Science & Technology*, **29** (11), 2713-2717.

Full Text: [1995\Env Sci Tec29, 2713.pdf](1995/Env%20Sci%20Tec29,%202713.pdf)

Abstract: Assessments of the hazard of toxic chemicals in soil are made without concern about the possibility that their bioavailability may change with time. The patterns of disappearance of persistent compounds in the field and laboratory studies show a declining availability to microorganisms with residence time in soil. Changes in extractability with residence time and the kinetics of sorption and desorption suggest that the compounds are becoming sequestered in inaccessible microsites within the soil matrix. Diminishing toxicity as chemicals age in soil is evident in a limited number of assessments. Such findings suggest that the hazard and risk from toxic chemicals diminish as the compounds persist in soil.

Keywords: Adsorption, Aquifer Material, Bioavailability, Desorption, Desorption-Kinetics, Field, Halogenated Organic-Chemicals, Kinetics, Long-Term Sorption, Residues, Site, Sorption, TCDD

Notes: highly cited

? Burris, D.R., Campbell, T.J. and Manoranjan, V.S. (1995), Sorption of trichloroethylene and tetrachloroethylene in a batch reactive metallic iron-water system. *Environmental Science & Technology*, **29** (11), 2850-2855.

Full Text: [1995\Env Sci Tec29, 2850.pdf](1995/Env%20Sci%20Tec29,%202850.pdf)

Abstract: Sorption and reduction kinetics of trichloroethylene (ICE) and tetrachloroethylene (PCE) with metallic (zero-valent) iron were determined in a closed, well-mixed, anaerobic batch system by measuring aqueous and total system concentrations of the respective chlorinated solvent as a function of time. The reaction orders with respect to TCE and PCE total system concentrations were 2.7 and 1.3, respectively, indicating that the reaction mechanisms are complex. Both compounds exhibited nonlinear sorption behavior and could be fitted by the generalized Langmuir isotherm expression. After accounting for the mass sorbed to the iron, the reduction rates of PCE and TCE are first-order. This indicates that the bulk of sorption is to nonreactive sites. Competitive sorption was observed when both PCE and TCE were present; however, no competition for reaction was detected. The design and study of treatment systems for chlorinated solvents using metallic iron requires consideration of sorption processes.

Keywords: Kinetics, Langmuir Isotherm, Nonlinear Sorption, Sorption

Crocker, F.H., Guerin, W.F. and Boyd, S.A. (1995), Bioavailability of naphthalene sorbed to cationic surfactant-modified smectite clay. *Environmental Science & Technology*, **29** (12), 2953-2958.

Full Text: [E\Env Sci Tec29, 2953.pdf](E/Env%20Sci%20Tec29,%202953.pdf)

Abstract: The bioavailability of naphthalene sorbed to hexadecyltrimethylammonium (HDTMA)-modified smectite clay was evaluated by modeling naphthalene mineralization kinetics in dilute clay slurries and in clay-free controls. Sorbed naphthalene was directly available to Pseudomonas putida strain 17484, as evidenced by initial rates and extents of naphthalene mineralization that significantly exceeded predicted values assuming sorbed naphthalene was unavailable. For the soil isolate, Alcaligenes sp, strain NP-Alk, sorbed naphthalene was unavailable, and measured rates agreed closely with predicted, rates. For this bacterium, sorbed naphthalene was available only upon its desorption from the HDTMA-modified, smectite. This desorption was very rapid from unaggregated HDTMA-smectites and from HDTMA-clay aggregates of less than 0.25-mm diameter. Naphthalene mineralization in the presence of larger clay aggregates (0.25-1-mm diameter) was desorption rate limited. Contaminants sorbed to HDTMA-modified soils or clays should be largely bioavailable to bacteria, since the desorption rates from these materials are high and some degradative bacteria have the ability to directly utilize the sorbed contaminants.

Keywords: Organic Contaminants, Degradation, Soil, Kinetics, Biodegradation, Sorption, Acid

Schiewer, S. and Volesky, B. (1995), Modeling of the proton-metal ion exchange in biosorption. *Environmental Science & Technology*, **29** (12), 3049-3058.

Full Text: [E\Env Sci Tec29, 3049.pdf](E/Env%20Sci%20Tec29,%203049.pdf)

Abstract: Biosorption of the heavy metal ions Cd2+, Cu2+ and Zn2+ by previously protonated nonliving biomass of the marine alga *Sargassum* fluitans was observed to be coupled with a release of protons. Metal ion binding experiments with continuously controlled pH were performed. The metal ion and proton binding at equilibrium were modeled as a function of pH and metal ion concentration using a modified multicomponent Langmuir sorption model. Both the exchange of metal ions for protons from functional groups in their acidic form and the sorption of metal ions on ionized groups were considered. The model is applicable to adsorption by biomass with free or protonated metal binding sites as well as to metal ion desorption with acids since the direction of the reaction depends simply on the given initial conditions. The model parameters were incorporated into the MINEQL + equilibrium program, leading to a prediction of the equilibrium, e.g., of metal ion laden biosorbent desorption performance for given initial conditions.

Keywords: Marine-Algae, Cobalt, Polymers, Biomass, Binding

Booty, M.R., Bozzelli, J.W., Ho, W.P. and Magee, R.S. (1995), Simulation of a three-stage chlorocarbon incinerator through the use of a detailed reaction-mechanism-chlorine to hydrogen mole ratios below 0.15. *Environmental Science & Technology*, **29** (12), 3059-3063.

Full Text: [E\Env Sci Tec29, 3059.pdf](E/Env%20Sci%20Tec29,%203059.pdf)

Johnson, J. (1996), Risk assessment draft gives WTI incinerator clean slate. *Environmental Science & Technology*, **30** (1), A14-A15.

Notes: highly cited, DDifussion

Pignatello, J.J. and Xing, B.S. (1996), Mechanisms of slow sorption of organic chemicals to natural particles. *Environmental Science & Technology*, **30** (1), 1-11.

Full Text: [E\Env Sci Tec30, 1.pdf](E/Env%20Sci%20Tec30,%201.pdf)

Abstract: The use of equilibrium expressions for sorption to natural particles in fate and transport models is often invalid due to slow kinetics. This paper reviews recent research into the causes of slow sorption and desorption rates at the intraparticle level and how this phenomenon relates to contaminant transport, bioavailability, and remediation. Sorption kinetics are complex and poorly predictable at present. Diffusion limitations appear to play a major role. Contending mechanisms include diffusion through natural organic matter matrices and diffusion through intraparticle nanopores. These mechanisms probably operate simultaneously, but the relative importance of each in a given system is indeterminate. Sorption shows anomalous behaviors that are presently not well explained by the simple diffusion models, including concentration dependence of the slow fraction, distributed rate constants, and kinetic hysteresis. Research is needed to determine whether adsorption/desorption bond energies may play a role along with molecular diffusion in slow kinetics. The possible existence of high-energy adsorption sites both within the internal matrix of organic matter and in nanopores is discussed. Sorption can be rate-limiting to biodegradation, bioavailablity, and subsurface transport of contaminants. Characterization of mechanism is thus critical for fate and risk assessment. Studies are needed to measure desorption kinetics under digestive and respiratory conditions in receptor organisms. Conditions under which the constraint of slow desorption may be overcome are discussed, including the addition of biological or chemical agents, the application of heat, and the physical alteration of the soil.

Keywords: Adsorption, Aliphatic Halocarbons, Aquifer Material, Assessment, Bioavailability, Biodegradation, Characterization, Complex, Contaminant Transport, Contaminants, Contaminated Soils, Desorption, Desorption Kinetics, Desorption-Kinetics, Diffusion, Equilibrium, Fate, Field Soil Samples, Hydrophobic Contaminants, Intraparticle Diffusion, Kinetic, Kinetics, Long-Term Sorption, Mechanism, Mechanisms, Models, Nonequilibrium Sorption, Particles, Polycyclic Aromatic-Hydrocarbons, Remediation, Research, Respiratory, Review, Risk, Risk Assessment, Soil, Sorption, Sorption Kinetics, Subsurface, System, Transport, USA, Water

Fitch, A. and Du, J. (1996), Solute transport in slay media: Effect of humic acid. *Environmental Science & Technology*, **30** (1), 12-15.

Full Text: [E\Env Sci Tec30, 12.pdf](E/Env%20Sci%20Tec30,%2012.pdf)

Abstract: The ability of humic materials to remove cations from the gallery region of clay stacks is monitored directly using clay-modified electrodes. It is found that humic materials reduce access to the inner layer region by clogging access pores and by binding cations.

Keywords: Clay-Modified Electrodes, Natural Organic-Matter, Sandy Aquifer, Water

? Nzengung, V.A., Voudrias, E.A., NkediKizza, P., Wampler, J.M. and Weaver, C.E. (1996), Organic cosolvent effects or sorption equilibrium at hydrophobic organic chemicals by organoclays. *Environmental Science & Technology*, **30** (1), 89-96.

Full Text: [1996\Env Sci Tec30, 89.pdf](1996/Env%20Sci%20Tec30,%2089.pdf)

Abstract: Isotherms were measured for sorption of naphthalene and diuron by four organoclays in equilibrium with various mixtures of methanol and water. The organoclays were prepared from Wyoming montmorillonite by replacing the natural exchangeable cations of the day by the quaternary ammonium ions TMA (tetramethylammonium), TMPA (trimethylphenylammonium), HDTMA (hexadecyltrimethylammonium), and BDTDA (benzyldimethyltetradecylammonium). TMPA-clay showed the greatest sorptive capacity for naphthalene, while BDTDA-clay was the most effective sorbent for diuron. The sorption mechanism for each sorbate-sorbent combination was related to the arrangement of the quaternary ammonium cations in the exchanged clay acid the volume fraction of methanol in solution (f(c)). As expected from the solvophobic theory, the linear sorption coefficients decreased loglinearly with increasing f(c) in the binary solvent mixture, except for TMPA-clay at f(c) > 0.5. In addition to solute-solvent and solvent-sorbent interactions, an additional effect involving solute-organoclay interactions influenced the sorption of naphthalene and diuron by organoclays from aqueous and mixed solvents.

Keywords: Natural Sediments, Water, Soils, Adsorption, Solvent, Clay, Pollutants, Smectite, Systems, Adsorbent

Pyle, S.M., Nocerino, J.M., Deming, S.N., Palasota, J.A., Palasota, J.M., Miller, E.L., Hillman, D.C., Kuharic, C.A., Cole, W.H., Fitzpatrick, P.M., Watson, M.A. and Nichols, K.D. (1996), Comparison of AAS, ICP-AES, PSA, and XRF in determining lead and cadmium in soil. *Environmental Science & Technology*, **30** (1), 204-213.

Full Text: [E\Env Sci Tec30, 204.pdf](E/Env%20Sci%20Tec30,%20204.pdf)

Abstract: Samples from a hazardous waste site contaminated with lead and cadmium were analyzed by four independent laboratories, each using a different technique: atomic absorption spectroscopy (AAS), X-ray fluorescence (XRF) spectroscopy, inductively coupled plasma-atomic emission spectroscopy, (ICP-AES), and potentiometric stripping analysis (PSA). The four data sets were retrospectively analyzed to (1) establish the magnitudes of uncertainty in the measurements, (2) evaluate the comparability of the four instrumental methods, and (3) determine if any significant correlations existed between individual sets of data, In general, the four techniques gave comparable results for the analysis of lead and cadmium, with the best agreement between PSA and AAS. Concentrations determined by PSA were higher than those measured by ICP-AES, AAS, and XRF, while concentrations determined by XRF were lower than or equal to recoveries determined by ICP-AES and AAS. Principal component analysis determined that the two major principal components in the sample space of the data set were analyte concentration and sample preparation. The ICP-AES data were used to look for correlations among other elements in the samples. it was shown that concentrations of four of these elements (aluminum, zinc, iron, and calcium) were significantly higher than 19 other elements determined by ICP-AES. Principal component analysis on those 19 elements showed a first-component variation attributable to an analyte concentration effect and a second-component variation attributable to an analyst-day effect.

Bandh, C., Ishaq, R., Broman, D., Naf, C., Rönquist-Nii, Y. and Zebühr, Y. (1996), Separation for subsequent analysis of PCBs, PCDD/Fs, and PAHs according to aromaticity and planarity using a two dimensional HPLC system. *Environmental Science & Technology*, **30** (1), 214-219.

Full Text: [E\Env Sci Tec30, 214.pdf](E/Env%20Sci%20Tec30,%20214.pdf)

Abstract: In this paper, an automated separation method is described for the subsequent GC/MS analysis of polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs), polycyclic aromatic compounds (PAHs), and related compounds in complex environmental matrices. The highperformance liquid chromatography (HPLC) method utilizes a coupled column system consisting of a nitrophenylpropylsilica (nitro) column (Nucleosil, 5 µm, 250×4.6 mm) and a 2-(1-pyrenyl)ethyldimethylsilylated silica (PYE) column (Cosmosil, 5 µm, 150×4.6 mm) and provides five well-defined fractions ready for injection on GC/MS. The fractions are as follow: aliphatic/monocyclic aromatic compounds, mono-tetra-ortho-PCBs, non-ortho-PCBs, PCDD/Fs (tetra-octa-chlorinated), and PAHs. The separation takes less than 40 min and consumes less than 70 mL of solvents. Evaluation of the HPLC system was performed with both environmentally collected samples and standard solution mixtures containing a wide range of PCBs, PCDD/Fs, and PAHs.

Keywords: Dibenzo-Para-Dioxins, 2-(1-Pyrenyl)Ethyldimethylsilylated Silica Column, Performance Liquid-Chromatography, Polychlorinated-Biphenyls, Environmental-Samples, Extraction, PCDFs, PACS

Fourest, E. and Volesky, B. (1996), Contribution of sulfonate groups and alginate to heavy metal biosorption by the dry biomass of *Sargassum fluitans*. *Environmental Science & Technology*, **30** (1), 277-282.

Full Text: [E\Env Sci Tec30, 277.pdf](E/Env%20Sci%20Tec30,%20277.pdf)

Abstract: The mechanism of heavy metal complexation by the dry biomass of the brown seaweed *Sargassum fluitans* was investigated at the molecular level using different techniques. Simultaneous potentiometric and conductimetric titrations gave some information concerning the amount of strong and weak acidic functional groups in the biomass (0.25±0.05 mequiv/g and 2.00±0.05 mequiv/g, respectively). Those results were confirmed by the chemical identification of sulfonate groups (0.27 mequiv/g±0.03) and alginate (45% of the dry weight) corresponding to 2.25 mmol of carboxyl groups/g of biomass. Modification of these functional groups by methanolic hydrochloride or propylene oxide demonstrated the predominant role of alginate in the uptake of cadmium and lead. However, sulfonate groups can also contribute, to a lower extent, to heavy metal binding, particularly at low pH. Eventually, FTIR spectrophotometry on protonated or cadmium-loaded alginate and *S. fluitans* biomass physically demonstrated that cadmium binding arises by bridging or bidentate complex formation with the carboxyl groups of the alginate.

Keywords: Binding

de Jonge, H. and Mittelmeijer Hazeleger, M.C. (1996), Adsorption of CO2 and N2 on soil organic matter: Nature of porosity, surface area, and diffusion mechanisms. *Environmental Science & Technology*, **30** (2), 408-413.

Full Text: [E\Env Sci Tec30, 408.pdf](E/Env%20Sci%20Tec30,%20408.pdf)

Abstract: The surface area of soil organic matter (SOM) is a crucial parameter for the interpretation of sorption mechanisms of organic contaminants. The surface area of three SOM samples was studied by using CO2 and N2 gas adsorption, revealing that SOM is a microporous material with a high surface area of 94-174 m2g-1. The ethylene glycol monoethyl ether (EGME) retention technique has major drawbacks for application to SOM samples, as liquid EGME changes the SOM solid phase density. Nitrogen (N2) is subject to molecular sieving at 77 K due to activated diffusion in micropores. CO2 is not limited by activated diffusion since higher experimental temperatures are applied (273 K). About 95-99% of the SOM surface area is formed by micropores with maximum restrictions of approximately 0.5 nm. Results suggest that the diffusion coefficient of CO2 is influenced by the crosslinking density of the matrix and that the microporous structure is not strongly affected by hydration of the sample. On the basis of pore dimensions, configurational diffusion is proposed as the primary transport mechanism of nonionic organic contaminants in SOM micropores.

Keywords: Distributed Reactivity Model, Nonequilibrium Sorption, Sediments, Hydrocarbons, Equilibria, Water, N2

Ghosh-Dastidar, A., Mahuli, S., Agnihotri, R. and Fan, L.S. (1996), Selenium capture using sorbent powders: Mechanism of sorption by hydrated lime. *Environmental Science & Technology*, **30** (2), 447-452.

Full Text: [E\Env Sci Tec30, 447.pdf](E/Env%20Sci%20Tec30,%20447.pdf)

Abstract: This study investigates the potential of mineral sorbents to capture selenium which is sufficiently volatile to occur in the flue gas in vapor state. The sorption studies are conducted in a high-temperature reactor using SeO2 as the source of selenium. In both high (800-1000°C) and medium-temperature (400-700°C) range, hydrated lime exhibits superior selenium sorption capability compared to other sorbent powders. The results show that the mechanism of capture by Ca(OH)2 is not a simple physical adsorption process but seems to involve a chemical reaction between CaO and SeO2. The medium temperature range of 400-600°C is favorable for the reaction to occur and leads to high selenium sorption. At higher temperatures, thermodynamic equilibrium aids dissociation of the reaction product, and the amount of metal capture reduces drastically with increasing temperature. XRD studies further confirm that calcium selenite is the dominant reaction product.

Meeussen, J.C.L., Scheidegger, A., Hiemstra, T., Van Riemsdijk, W.H. and Borkovec, M. (1996), Predicting multicomponent adsorption and transport of fluoride at variable pH in a goethite-silica sand system. *Environmental Science & Technology*, **30** (2), 481-488.

Full Text: [E\Env Sci Tec30, 481.pdf](E/Env%20Sci%20Tec30,%20481.pdf)

Abstract: Environmental impacts of soil pollution are greatly affected by the mobility and migration contaminants in soil. Multicomponent transport processes can play an important role in this migration. Therefore, modeling of transport processes and prediction of contaminant mobility as a function of soil properties can be a useful tool in risk evaluation. This work shows how a mechanistic model of ion adsorption an variable charged surfaces combined with a convective dispersive solute transport model was used to predict multicomponent transport of fluoride at variable pH in a goethite-silica sand column. In order to show the potential of this type of modeling, the chemical properties of the column material used in the transport calculations were not derived from measurements on the material itself, but predicted from independent data on synthetic goethite and silica. In this way the only parameters needed to predict the transport of fluoride and acidity were the chemical composition of the infiltrating solution, and the surface areas of goethite and silica present in the column. Although no chemical data of the actual column material were used, the agreement between predicted and experimental fluoride and pH breakthrough curves was very good. This shows that this type of modeling can be very useful for the understanding of multicomponent transport processes.

Keywords: Solid-Solution Interface, (Hydr)Oxides, Soils, Model

van der Hoek, E.E. and Comans, R.N.J. (1996), Modeling arsenic and selenium leaching from acidic fly ash by sorption on iron (hydr)oxide in the fly ash matrix. *Environmental Science & Technology*, **30** (2), 517-523.

Full Text: [E\Env Sci Tec30, 517.pdf](E/Env%20Sci%20Tec30,%20517.pdf)

Abstract: The sorption of As and Se on iron (hydr)oxide in acidic fly ash is studied as a possible process controlling the leaching of these contaminants. Following controlled leaching experiments with an acidic fly ash, sorption of As and Se is investigated both on crystalline and amorphous iron (hydr)oxide, using partial chemical extractions and isotopic exchange experiments. Virtu ally all As and Se at the fly ash surface, which is potentially available for leaching, is shown to be associated with hydroxylamine extractable “amorphous” iron (hydr)oxides in the fly ash matrix. Isotopic exchange experiments suggest that at pH < 10 the oxyanions are partly coprecipitated with secondary-formed amorphous iron (hydr)oxide, a process reducing their availability. The leaching of As and Se from acidic fly ash is described by a simplified model of surface complexation on amorphous iron (hydr)oxide, taking the limited availability of iron-associated As and Se into account. This approach is shown to constitute a useful tool to model sorption control of contaminant leaching from waste materials.

Keywords: Sequential Extraction Techniques, Fuel Combustion Residues, Inorganic Constituents, Aquatic Sediments, Adsorption, Soils, Dissolution, Speciation, Metals, Oxyhydroxides

Scheidegger, A.M., Lamble, G.M. and Sparks, D.L. (1996), Investigation of Ni sorption on pyrophyllite: An XAFS study. *Environmental Science & Technology*, **30** (2), 548-554.

Full Text: [E\Env Sci Tec30, 548.pdf](E/Env%20Sci%20Tec30,%20548.pdf)

Abstract: Sorption reactions at the solid-water interface decrease solute mobility and often control the fate, bioavailability, and transport of metal ions in soils and groundwaters. A thorough understanding of the structural environment of metals at the solid-water interface is therefore of fundamental importance. In this study, X-ray absorption fine structure (XAFS) spectroscopy was used to discern the local atomic structure of Ni(II) sorbed onto pyrophyllite. The first coordination shell consists of 6 O atoms at 2.02-2.04 Angstrom. For the second shell, XAFS data suggest a single Ni-AI/Si distance (2.96-3.03 Angstrom), indicative of edge sharing of Ni and Al octahedra and possibly the presence of mixed nickel-aluminum hydroxides. As Ni surface loading on pyrophyllite increased, the number of Ni second-neighbor atoms at a distance of 2.99-3.00 Angstrom increased from N approximate to 1 to N approximate to 5. The presence of multinuclear surface complexes was depicted at low surface loading and at reaction conditions undersaturated with respect to the formation of Ni(OH)2(s). This observation suggests that the total coverage of surface sites is not necessary for the formation of multinuclear surface complexes and implies that the pyrophyllite surface promotes hydrolysis and multinuclear complex formation.

Keywords: X-Ray Absorption, Oxide-Water Interface, Surface Precipitation, Aqueous-Solutions, Polyhedral Approach, Clay-Minerals, Ferric Oxides, Adsorption, Spectroscopy, Kaolinite

Lugar, R.M., Harless, R.L., Dupuy, A.E. and McDaniel, D.D. (1996), Results of monitoring for polychlorinated dibenzo-p-dioxins and dibenzofurans in ambient air at McMurdo Station, Antarctica. *Environmental Science & Technology*, **30** (2), 555-561.

Full Text: [E\Env Sci Tec30, 555.pdf](E/Env%20Sci%20Tec30,%20555.pdf)

Abstract: This paper presents the results of ambient air monitoring for polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) performed during the 1992-1993 and 1993-1994 austral summers in the vicinity of McMurdo Station, Antarctica. Twenty-eight air samples were collected from four different locations to determine the identity and concentration of PCDD/PCDF compounds. PCDD/PCDF compounds were not detected at either the predominantly upwind location or a more remote site on Black Island. Trace levels of only a few PCDD/PCDF congeners were detected sporadically at a location approximately 500 m downwind of the station. The most frequent, most varied, and highest levels of PCD Ds/PCDFs were measured at a “downtown” location, where concentrations of total PCDDs ranged from 0.12 to 1.80 pg/m3 and total PCDFs ranged from less than 0.02 to 2.77 pg/m3. The data indicate that there are combustion sources at McMurdo other than the solid waste incinerator (power pla nts, vehicles, heating furnaces, etc.)that contribute PCDD/PCDF compounds to the ambient air. The greatest variety and highest concentration of PCDD/PCDF congeners measured in 1992-1993 during incineration of selected solid wastes implicates the interim incinerator as the likely source of the increased presence of these compounds in air. Results from the remote Black Island site indicate that the background Antarctic air is still “free” of PCDD/PCDF compounds (not detectable at current method detection limits in the sub-pg/m3 range).

Keywords: Chlorinated Dibenzofurans, Transport

Kennedy, S.W., Lorenzen, A. and Norstrom, R.J. (1996), Chicken embryo hepatocyte bioassay for measuring cytochrome P4501A-based 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalent concentrations in environmental samples. *Environmental Science & Technology*, **30** (2), 706-715.

Full Text: [E\Env Sci Tec30, 706.pdf](E/Env%20Sci%20Tec30,%20706.pdf)

Abstract: A bioassay that uses chicken embryo hepatocyte (CEH) primary cultures for measuring 2,3,7,8-tetrachlorodibenzo-p-dioxin equivalent (TCDD-EQ) concentrations in extracts prepared from wild bird eggs contaminated with complex mixtures of polychlorinated biphenyls (PCBs), dibenzo-p-dioxins (PCDDs), dibenzofurans (PCDFs), and other halogenated aromatic hydrocarbons is described. The CEH bioassay uses an efficient method for measuring ethoxyresorufin-O-deethylase (EROD) in hepatocytes cultured in 48-well plates to obtain bioassay-derived TCDD-EQ concentrations (TCDD-EQ(bio)). Induction equivalency factors (IEFs) were determined for 39 PCB congeners, 2,3,7,8-TCDD, 1,2,3,7,8-PCDD, and 2,3,7,8-TCDF. TCDD-EQ(bio) concentrations in eggs from herring gulls, Larus argentatus, and great blue herons, Ardea herodias, were highly correlated with TCDD-EQ concentrations calculated (TCDD-EQ(calc)) from chemical residue data and IEFs (r(2) = 0.977, slope = 0.99). Unlike other in vitro bioassays, 2,2’,3,4,4’,5’-hexachlorobiphenyl (PCB 138) made a significant contribution to TCDD-EQ(calc) in CEH cultures. TCDD-EQ(bio) concentrations were also highly correlated to TCDD-EQ(calc) obtained using toxic equivalency factors (TEFs) derived from various in vivo and in vitro toxic and biochemical end points. The CEH bioassay is a cost-effective method for measuring TCDD-EQ(bio) concentrations in environmental samples.

Keywords: Ethoxyresorufin-O-Deethylase, Polychlorinated-Biphenyls PCBS, Dibenzo-Para-Dioxins, Halogenated Aromatic-Hydrocarbons, Great-Lakes, Cell-Culture, Ah-Receptor, Chemical Contamination, Enzyme-Induction, Erod Activity

Iannuzzi, T.J., Huntley, S.L. and Finley, B.L. (1996), Comment on “Levels of polychlorodibenzo-p-dioxins and dibenzofurans in crab tissues from the Newark Raritan Bay system”. *Environmental Science & Technology*, **30** (2), 721-722.

Full Text: [E\Env Sci Tec30, 721.pdf](E/Env%20Sci%20Tec30,%20721.pdf)

Keywords: Surficial Sediments, New-Jersey, Potential Sources, Contamination, Residues, PCDD

Cai, Z.W., Gross, M.I., Cristini, A., Tucker, R.K. and Prince, R. (1996), Response to comments on “Levels of polychlorodibenzo-p-dioxins and dibenzofurans in crab tissues from the Newark Raritan Bay system”. *Environmental Science & Technology*, **30** (2), 723-724.

Full Text: [E\Env Sci Tec30, 723.pdf](E/Env%20Sci%20Tec30,%20723.pdf)

Keywords: Surficial Sediments, New-Jersey, Potential Sources, Residues

Johnson, J. (1996), Accident, ecological analyses hit in incinerator risk assessment. *Environmental Science & Technology*, **30** (3), A111-A112.

Full Text: Env Sci Tec30, A111

Addink, R., Antonioli, M., Olie, K. and Govers, H.A.J. (1996), Reactions of dibenzofuran and 1,2,3,4,7,8-hexachlorodibenzo-*p*-dioxin on municipal waste incinerator fly ash. *Environmental Science & Technology*, **30** (3), 833-836.

Full Text: [E\Env Sci Tec30, 833.pdf](E/Env%20Sci%20Tec30,%20833.pdf)

Abstract: Dibenzofuran (DF) on fly ash can be converted to polychlorinated dibenzofurans (PCDF) in a N2/O2/HCl atmosphere, yielding especially 2,3,7,8-substituted congeners. This is consistent with an electrophilic aromatic substitution mechanism. 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (1,2,3,4,7, 8-H6CDD) on fly ash can be chlorinated by HCl both in N2 and O2 atmospheres. Dechlorination and decomposition reactions are not important under these conditions, and isomerization reactions do not take place either. 1,2,3,4,7,8-H6CDD dechlorinates or decomposes on fly ash when no HCl is present. Only a limited number of dechlorination products are formed. Chlorination and dechlorination are separate processes, not occurring simultaneously.

Keywords: Polychlorinated Dibenzofurans, Dioxin Formation, p-Dioxins, Carbon

Weber, Jr., W.J. and Huang, W.L. (1996), A distributed reactivity model for sorption by soils and sediments. 4. Intraparticle heterogeneity and phase-distribution relationships under nonequilibrium conditions. *Environmental Science & Technology*, **30** (3), 881-888.

Full Text: [E\Env Sci Tec30, 881.pdf](E/Env%20Sci%20Tec30,%20881.pdf)

Abstract: Rates of phenanthrene sorption by four different types of soils and sediments were characterized by examining the time dependence of solute phase distribution relationships (PDRs) in completely-mixed batch reactors. Unlike conventional single-level concentration methods, the experiments were conducted using a range of concentrations to obtain a time series of nonequilibrium PDRs for each sorbent-sorbate system over reaction periods ranging from 1 min to 14 days. In all cases tested, the nonequilibrium PDRs changed from approximately linear form to increasingly nonlinear form as the time of reaction increased. A Freundlich-type relationship, *q*(*t*) = *K*F(*t*)*C*(*t*)*n*(*t*), was used to relate values of measured temporal solid-phase solute concentrations, *q*(*t*), to corresponding solution-phase solute concentrations *C*(*t*). After a short “initiation” stage, the parameters *n*(*t*) and *K*F(*t*) were observed to vary functionally with logarithmic time. A three-domain particle-scale model predicated on the existence of discrete soil components (exposed inorganic surfaces and amorphous and condensed soil organic matter) is invoked to explain the observed sorption behavior and functional relationships underlying the time dependence of the PDRs.

Keywords: Adsorption-Desorption, Aquifer Materials, Conceptual Models, Dissolved Humic Materials, Hydrophobic Organic-Compounds, Mass-Transfer, Natural Sediments, Organic Matter, Phenanthrene, Polycyclic Aromatic-Hydrocarbons, Sorbing Porous-Media, Sorption, Transport

Ali, M.A. and Dzombak, D.A. (1996), Competitive sorption of simple organic acids and sulfate on goethite. *Environmental Science & Technology*, **30** (4), 1061-1071.

Full Text: [E\Env Sci Tec30, 1061.pdf](E/Env%20Sci%20Tec30,%201061.pdf)

Abstract: Sorption of phthalic acid, chelidamic acid and sulfate onto goethite (α-FeOOH) was examined in single-sorbate and in sulfate-organic acid binary-sorbate systems to determine the extent of competition between the simple organic acids and sulfate. Sorption characteristics of sulfate and the organic acids were similar and resembled those reported for humic substances onto oxides. Sorption data for all three sorbates over a wide range of conditions (pH, I, sorbate/sorbent ratio) were described quantitatively by the generalized two-layer model with a unique set of surface reactions and equilibrium constants for each sorbate. Sorption affinities of sulfate and the organic acids were comparable and sulfate effectively competed with the organic acids for surface sites on goethite, particularly at low pH. These results suggest that sulfate can significantly influence the sorption of simple organic acids and humic substances in natural aquatic systems. Predictions of sorption in binary-sorbate systems based on single-sorbate data fits represented competitive sorption data reasonably well over a wide range of conditions. However, there were underpredictions of minor-component sorption in the presence of a major component, which may be explained by sorbate-specific surface site heterogeneity and/or by inaccurate representation of Coulombic effects in the model.

Keywords: Surface Complexation Models, Amorphous Iron Oxyhydroxide, Metal Humate Interactions, Oxide Water Interface, Humic Substances, Oxalate Adsorption, Hydrous Oxides, α-Feooh, Chromate, Phosphate

Tamura, H., Katayama, N. and Furuichi, R. (1996), Modeling of ion-exchange reactions on metal oxides with the Frumkin isotherm. 1. Acid-base and charge characteristics of MnO2, TiO2, Fe3O4, and Al2O3 surfaces and adsorption affinity of alkali metal ions. *Environmental Science & Technology*, **30** (4), 1198-1204.

Full Text: [E\Env Sci Tec30, 1198.pdf](E/Env%20Sci%20Tec30,%201198.pdf)

Abstract: Metal oxides abundant in natural environments affect the concentrations of ions in waters by adsorption. The ion adsorption ability of oxides arises from the acid-base nature of surface hydroxyl groups formed by dissociative chemisorption of water molecules. The protonation and deprotonation reactions of hydroxyl groups produce electric charges, resulting in ion adsorption to maintain electric neutrality(ion exchange). The amount of surface charge in alkali metal nitrate solutions was measured as a function of pH by titration, and the ion-exchange reactions accompanying the charge formation were modeled by using the Frumkin isotherm, which assumes suppression of the reaction due to lateral interactions between the interphase species. This model embodies not only electrical but also chemical, geometrical, and/or other lateral interactions and can be applied to “real”, not well-defined oxide/solution systems in natural environments, From the model parameters, it was found that the intensity of cation exchange (deprotonation) increases in the order: Al2O3 < Fe3O4 < TiO2 < MnO2 and the intensity of anion exchange (protonation) decreases in the same order. The electronegativity of the lattice metal ions of these oxides was estimated and found to increase in the order above. It is suggested that with electronegativity of the lattice metal ions the electron density of adjacent lattice oxide ions and, hence the acid-base nature of hydroxyl sites, changes. Also, the adsorption affinity of alkali metal ions was evaluated and discussed within the model parameters.

Keywords: Hydroxyl-Groups, Solution Interface, Manganese-Dioxide, Water Interface, Complexation, Constants, Sorption

? Kilduff, J.E., Karanfil, T., Chin, Y.P. and Weber, Jr., W.J. (1996), Adsorption of natural organic polyelectrolytes by activated carbon: A size-exclusion chromatography study. *Environmental Science & Technology*, **30** (4), 1336-1343.

Full Text: [1996\Env Sci Tec30, 1336.pdf](1996/Env%20Sci%20Tec30,%201336.pdf)

Abstract: The adsorption of several different organic polyelectrolytes from aqueous solution by activated carbon was characterized. Polyelectrolytes included humic acids extracted from peat and soil, polymaleic acid, a synthetic polymer identified as a fulvic acid surrogate, and natural organic matter in Huron River (Ann Arbor, MI) water. Isotherms of individual ultrafiltration size fractions confirmed that smaller molecular size components adsorb to a greater extent on an adsorbent mass basis. The molecular weight distributions of organic polyelectrolytes remaining in solution after equilibration with various amounts of activated carbon were measured with highperformance size-exclusion chromatography (HPSEC). A comparison of molecular weight distributions demonstrated conclusively that small molecular size components are adsorbed preferentially, i.e., adsorptive fractionation on the basis of molecular size occurs. This behavior was observed for each of the wide variety of samples studied, suggesting that it may be a rather general feature of the adsorption of polyelectrolyte mixtures from solution by activated carbon.

Keywords: Acids, Activated Carbon, Adsorption, Configuration, Fractionation, Gac, Humic Substances, Matter, Natural Organic Matter, Organic Matter, Poly-Electrolytes, Polydispersity, Ultrafiltration, Water

? Kilduff, J.E., Karanfil, T. and Weber, Jr., W.J. (1996), Competitive interactions among components of humic acids in granular activated carbon adsorption systems: Effects of solution chemistry. *Environmental Science & Technology*, **30** (4), 1344-1351.

Full Text: [1996\Env Sci Tec30, 1344.pdf](1996/Env%20Sci%20Tec30,%201344.pdf)

Abstract: The adsorption by activated carbon of a humic acid extracted from Laurentian soil and polystyrene sulfonate, a synthetic polymer, was investigated, Size-exclusion chromatography was used to study competitive interactions among humic components by measuring the changes in molecular weight distributions of molecules remaining in solution after adsorption. The adsorption of humic substances was governed, in large part, by molecular size distribution in relation to adsorbent pore sizes. We demonstrate that the extent of adsorption increases with increasing ionic strength and calcium content. Increases in the extent of adsorption are due, in part, to a decrease in macromolecule size, our data suggest that these changes occur in solution prior to adsorption. The results of analyses employing size-exclusion chromatography demonstrate that low molecular weight fractions of humic material are preferentially removed from solution. Increases in the extent of adsorption correspond to shifts in the adsorbed molecular weight distribution to values.

Keywords: Activated Carbon, Adsorption, Binding, Calcium, Complexation, Fulvic-Acids, Heterogeneity, Humic Acid, Removal, Salts, Substances

Kjeller, L.O., Jones, K.C., Johnston, A.E. and Rappe, C. (1996), Evidence for a decline in atmospheric emissions of PCDD/Fs in the UK. *Environmental Science & Technology*, **30** (4), 1398-1403.

Full Text: [E\Env Sci Tec30, 1398.pdf](E/Env%20Sci%20Tec30,%201398.pdf)

Keywords: Chlorinated Dioxins, Source Inventory, United-Kingdom, Vegetation, Pentachlorophenol, Dibenzofurans, Environment, Sediments, Budget, PCDFs

Ong, C.G. and Leckie, J.O. (1996), Nonreversible adsorption of divalent metal ions (Mn2, Co2, Ni2, Cu2, and Pb2) onto goethite: Effects of acidification, Fe2 addition, and picolinic acid addition: Comment. *Environmental Science & Technology*, **30** (4), 1411.

Full Text: [E\Env Sci Tec30, 1411.pdf](E/Env%20Sci%20Tec30,%201411.pdf)

Stone, A.T. and Coughlin, B.R. (1996), Nonreversible adsorption of divalent metal ions (Mn2, Co2, Ni2, Cu2, and Pb2) onto goethite: Effects of acidification, Fe2 addition, and picolinic acid addition: Response. *Environmental Science & Technology*, **30** (4), 1412.

Full Text: [E\Env Sci Tec30, 1412.pdf](E/Env%20Sci%20Tec30,%201412.pdf)

Arocha, M.A., Jackman, A.P. and McCoy, B.J. (1996), Adsorption kinetics of toluene on soil agglomerates: Soil as a biporous sorbent. *Environmental Science & Technology*, **30** (5), 1500-1507.

Full Text: [E\Env Sci Tec30, 1500.pdf](E/Env%20Sci%20Tec30,%201500.pdf)

Abstract: Single-component vapor diffusion at low pressure into dry soil agglomerates provides a well-characterized system for investigating adsorption and diffusion mechanisms. Equilibrium and kinetic data for adsorption of toluene vapor on Yolo loam and montmorillonite clay were obtained in this study with a gravimetric method. More extensive equilibrium data were obtained with a headspace gas chromatographic technique. Freundlich isotherms provided a good fit to the equilibrium data for relative partial pressures less than 0.6. Adsorption of toluene from the gas phase occurred in two stages: the first was due to fast diffusion and adsorption in macropores, and the second was controlled by slower diffusion and adsorption in intragrain micropores. As several days are required to establish equilibrium, the effect of slow diffusion and adsorption would be overlooked in shorter studies. Numerical simulations described the isothermal adsorption of toluene on spherical soil particles subject to a step change in bulk concentration. Biporous diffusion models are necessary to interpret the distinct diffusional characteristics of toluene in macropores and micropores with nonlinear adsorption. The simulations quantitatively describe details of the adsorption history.

Keywords: Aquifer Material, Porous-Media, Sorption, Diffusion, Equilibrium, Desorption, Transport, Systems, Solids

Vasudevan, D. and Stone, A.T. (1996), Adsorption of catechols, 2-aminophenols, and 1, 2-phenylenediamines at the metal (hydr) oxide/water interface: Effect of ring substituents on the adsorption onto TiO2. *Environmental Science & Technology*, **30** (5), 1604-1613.

Full Text: [E\Env Sci Tec30, 1604.pdf](E/Env%20Sci%20Tec30,%201604.pdf)

Abstract: The extent of adsorption and the value of the adsorption equilibrium constant (K-intr (s)) for simple organic ligands is influenced by the identity of the ligand donor groups and other substituents on the aromatic ring. Catechols adsorb onto TiO2 to a significantly greater extent than 2-aminophenols, the adsorption of 1, 2-phenylenediamines is negligible. The TiO2 surface has a high ionic contribution to bonding, ligands possessing donor groups with the highest ionic contribution to bonding adsorb to the greatest extent. A covalent contribution to bonding can increase binding to Ti(IV)-containing surfaces, but only when the ionic contribution is already strong. Within each ligand class, substituents alter the competition between protons and surface sites for binding the deprotonated ligand. For this reason, pK (a1), pK (a2), and log K-intr (s) are all important in determining the extent of adsorption. Additionally, substituents that impart hydrophobicity also raise the extent of adsorption and the value of log K-intr (s).

Mukerjee, S., Somerville, M.C., Willis, R.D., Fox, D.L., Stevens, R.K., Kellogg, R.B., Stiles, D.C., Lumpkin, T.A. and Shy, C.M. (1996), Integrated assessment of reduced emission impacts from a biomedical waste incinerator. Atmospheric characterization and modeling applications on particulate matter and acid gases. *Environmental Science & Technology*, **30** (5), 1680-1686.

Full Text: [E\Env Sci Tec30, 1680.pdf](E/Env%20Sci%20Tec30,%201680.pdf)

Abstract: A composite approach involving wind sector analyses, receptor modeling, and dispersion modeling has been developed to estimate the impact of a biomedical waste incinerator (BWI). This is presented using measurements of 12-h ambient air particulate matter and acid gases from a versatile air pollutant sampler, with meteorological data obtained near the BWI as part of a larger short-term respiratory effects study. Monitoring was performed in the same time frame for three consecutive years, the first year being prior to installation of air pollution control devices (APCDs) at the BWI, the next year with the BWI having APCDs, and the final year with the BWI being “mothballed”. Use of integrated wind sector analyses and receptor/dispersion modeling provided evidence of reduced emission impacts at the monitoring site during the 3-year period. Principal component analysis combined with linear-angular correlation and regression provided further evidence of reduced BWI impacts in addition to information about the nature of emission sources. The effectiveness of applying a wind direction-based receptor/dispersion model approach to assess emission abatement plans is demonstrated.

Keywords: Size Distributions, Refuse Incinerator, Air, Aerosol

Notes: highly cited

Kinniburgh, D.G., Milne, C.J., Benedetti, M.F., Pinheiro, J.P., Filius, J., Koopal, L.K. and van Riemsdijk, W.H. (1996), Metal ion binding by humic acid: Application of the NICA-Donnan model. *Environmental Science & Technology*, **30** (5), 1687-1698.

Full Text: [E\Env Sci Tec30, 1687.pdf](E/Env%20Sci%20Tec30,%201687.pdf)

Abstract: A Donnan-type model for nonspecific binding of electrolyte ions has been combined with the nonideal competitive adsorption (NICA) model for specific binding to produce a model for ion binding to humic substances. The model considers site heterogeneity, non-ideality, multicomponent competition and electrostatic interactions. The NICA-Donnan model was fitted to data for H, Ca, Cd, Cu and Pb binding by a purified peat humic acid. The model fits were good and covered a wide range of pH and free metal concentrations. The parameters from these single metal data sets were then used to predict the competitive effect of Ca on Cd and Cu binding at various pHs. These predictions agreed well with the experimental data although there were some small but systematic differences. The new NICA-Donnan model also predicted reasonably well the increase in Cd and Cu binding on changing from a 0.1 M KNO3 background electrolyte to 0.01 M KNO3. A shortcoming of the model is that in some cases it significantly underestimated the H+/M2+ exchange ratio, especially at high pH and for Cu binding.

Keywords: Unified Physicochemical Description, Poly-Electrolyte Properties, Natural Organic-Ligands, Central North Pacific, Adsorption Models, Fulvic-Acids, Complexation Equilibria, Heterogeneous Surfaces, Humate Interactions, Cation Binding

Jakway, A.L., Sterling, A.M., Cundy, V.A. and Cook, C.A. (1996), Three-dimensional numerical modeling of a field-scale rotary kiln incinerator. *Environmental Science & Technology*, **30** (5), 1699-1712.

Full Text: [E\Env Sci Tec30, 1699.pdf](E/Env%20Sci%20Tec30,%201699.pdf)

Abstract: A steady-state numerical model for the rotary kiln segment of a hazardous waste incinerator is presented. This model builds on work previously conducted at Louisiana State University by including radiation and soot in the heat transfer analysis, by switching to an adiabatic kiln wall boundary condition, and by including a more accurate geometry and better fitting grid. These changes improve agreement with data taken from a field-scale rotary kiln, operating with a natural gas support flame but no waste processing, by up to 2 orders of magnitude compared to previously developed models at LSU, In most instances, prediction is within repeatability limits of the experiments. Grid dependency is demonstrated, especially at the upper front of the kiln where gradients are very steep. Near the exit of the kiln, however, where the limited experimental data are available, both coarse and refined grids produced very similar results. Parametric and sensitivity studies using the developed model are reported.

Keywords: Loaded Toluene Sorbent

Brzuzy, L.P. and Hites, R.A. (1996), Global mass balance for polychlorinated dibenzo-p-dioxins and dibenzofurans. *Environmental Science & Technology*, **30** (6), 1797-1804.

Full Text: [E\Env Sci Tec30, 1797.pdf](E/Env%20Sci%20Tec30,%201797.pdf)

Abstract: Chlorinated dioxins and dibenzofurans (PCDD/F) were measured in 107 soil samples globally, and depositional fluxes were determined. Deposition to land surfaces was estimated by dividing the earth into five depositional zones based on climatic and geographical factors. Mean depositional fluxes to these zones ranged from 18 to 610 ng m-2 yr-1. Low fluxes were observed in most zones not impacted by industrialization. Total global deposition from the atmosphere to land was estimated to be 12 500±1300 kg/yr. Based on limited data, deposition to the oceans was estimated to be about 610±1500 kg/yr, yielding a total global deposition of 13 100±2000 kg/yr from the atmosphere. Emissions of PCDD/F to the global atmosphere were estimated by determining emission factors and production rates for the major PCDD/F sources. The major sources considered in this study were municipal waste incineration, biomass combustion, steel and copper mill emissions, cement kiln emissions, medical waste incineration, and emissions from automobiles Total annual emissions were estimated to be 3000±600 kg. Global deposition (see above) is roughly four times greater than annual emissions. This suggests that sources of PCDD/F are not well-characterized. More data are needed on emission factors (particularly from developing countries) and on introduction rates of PCDD/F to the global atmosphere.

Keywords: Chlorinated Dioxins, Furans, Deposition, Emissions, PCDDs, PCDFs, Paper, Pulp

Raghunathan, K. and Gullett, B.K. (1996), Role of sulfur in reducing PCDD and PCDF formation. *Environmental Science & Technology*, **30** (6), 1827-1834.

Full Text: [E\Env Sci Tec30, 1827.pdf](E/Env%20Sci%20Tec30,%201827.pdf)

Abstract: Past research has suggested that the presence of sulfur (S) in municipal waste combustors (MWCs) can decrease the downstream formation of chlorinated organic compounds, particularly polychlorinated dibenzo-p-dioxins(PCDDs) and polychlorinated dibenzofurans (PCDFs). Thus, co-firing a MWC with coal, because of the S species from coal, may reduce PCDD and PCDF emissions. Experiments were carried out to test this hypothesis and to determine the role of S. A field-sampled MWC fly ash was injected into the EPA’s pilot-scale reactor, doped with hydrogen chloride (HCl). The tests involved either natural gas or coal combustion. Besides the combustion environment, MWC fly ash injection temperature and sulfur-to-chlorine ratio (S/Cl) were varied. Flue gas was sampled and analyzed for PCDD and PCDF to determine in-flight formation. In the natural-gas-fired reactor, when S was added (as sulfur dioxide, SO2), the PCDD and PCDF formation decreased dramatically at S/Cl ratios as low as 0.64, and with varying furnace conditions, the inhibitory effect was consistent for S/Cl ratios of about 1. In tests with the coal-fired furnace, the S inhibitory effect was again observed at S/Cl values of 0.8 and 1.2, respectively, for the two coals tested. S inhibition mechanisms were studied in a bench-scale reactor. Results show that the depletion of molecular chlorine (Cl2), an active chlorinating agent, by SO2 through a gas-phase reaction appears to be a significant inhibition mechanism in addition to previously reported SO2 deactivation of copper catalysts.

Keywords: Solid-Waste Combustion, Dibenzo-Para-Dioxins, Fly-Ash, Incineration, Precursors, Mechanism

Lasagni, M., Collina, E., Tettamanti, M. and Pitea, D. (1996), Thermal reaction kinetics and mechanism of PCDF, PCDD, and PCB parent compounds and activated carbon on silica. *Environmental Science & Technology*, **30** (6), 1896-1901.

Full Text: [E\Env Sci Tec30, 1896.pdf](E/Env%20Sci%20Tec30,%201896.pdf)

Abstract: The kinetics of PCDF, PCDD, and PCB parent compounds, dibenzofuran (DF), dibenzo-p-dioxin (DD), and biphenyl (BPh) as well as those of activated carbon (C) supported on silica gel (SiO2) are studied in batch experiments using the total organic carbon (TOC) global parameter. The rate constants along with the activation and thermodynamic parameters are determined. A nonlinear trend is observed for the Arrhenius and Eyring plots. The TOC decrease of DF-SiO2 DD-SiO2, and BPh-SiO2 mixtures is due to the organic reagent desorption, the rate of which is controlled by a surface reaction at lower temperatures while the reaction is diffusion limited at higher temperatures. The TOC decrease of activated carbon -SiO2 mixtures is due to oxidation to CO2, the rate-limiting steps being the chemical and physical processes at the lower and higher temperatures considered. The nature of the transition states is investigated, considering frequency factor (A), activation entropy (Delta S-not equal), and activation enthalpy (Delta H-not equal).

Keywords: Dibenzo-p-Dioxins, Fly-Ash, Polychlorinated Dibenzofurans, Municipal Incinerator, Dechlorination, Adsorption

Plette, A.C.C., Benedetti, M.F. and van Riemsdik, W.H. (1996), Competitive binding of protons, calcium, cadmium, and zinc to isolated cell walls of a gram-positive soil bacterium. *Environmental Science & Technology*, **30** (6), 1902-1910.

Full Text: [E\Env Sci Tec30, 1902.pdf](E/Env%20Sci%20Tec30,%201902.pdf)

Abstract: Metal ion binding to the bacterial cell wall is the first step in the interactions of a metal with a bacterium. Cadmium and zinc ion binding to isolated cell walls of Rhodococcus erythropolis A177 has been studied for a wide range of proton and calcium concentrations. The release of calcium ions and protons during metal ion binding is an indication of the competitive nature of the binding. Calculations, based on the metal binding data and the pH-dependent charging behavior, reveal that the cell wall becomes positively charged at high coverage with bivalent ions. A cooperative effect of the presence of calcium on metal ion binding was observed. Apparently, the cell wall structure is altered in the presence of bivalent ions. Since calcium is a dominant bivalent cation in most natural systems, one may regard the calcium as a “structure determining ion”. On the basis of a qualitative interpretation of the data, the NICA model was selected for a quantitative description of the data.

Keywords: *Bacillus-Subtilis*, Heavy-Metals, Sites, Ions, NMR

Mota, A.M., Rato, A., Brazia, C. and Goncalves, M.L.S. (1996), Competition of Al3+ in complexation of humic matter with Pb2+: A comparative study with other ions. *Environmental Science & Technology*, **30** (6), 1970-1974.

Full Text: [E\Env Sci Tec30, 1970.pdf](E/Env%20Sci%20Tec30,%201970.pdf)

Abstract: Humic matter (HM) presents a high affinity to bind lead ions, but complexation is affected by the presence of major ions such as Ca2+, Mg2+, and Al3+, which might have severe consequences in the bioavailability of lead. In this work the influence of aluminum(lll) in complexation of HM with Pb2+ will be studied and compared to the competition of Ca2+ in complexation of humic matter with Cd2+ or Zn2+. The competition between Al3+ and Pb2+ for the complexing groups of HM was studied from the titration of humic samples with lead, in the presence and absence of aluminum, at pH 4.5 and 0.01 M KNO3, followed by anodic stripping voltammetry. For the concentration ranges used, it was found that aluminum influences the coordination of lead to HM through an electrostatic effect expressed by an exponential factor, which is a function of aluminum and humic matter concentrations. This behavior is different from the competition of Ca2+ in complexation of HM with Cd2+ (or Zn2+), where Ca2+ decreases the number of HM sites available for the complexation but no electrostatic effect is observed. It is important to stress that the model presented can be applied to the complexation of lead with DOC in acidic soils containing gibbsite, where Al3+ concentrations may be high.

Keywords: Aluminum, Surface, Water

Xue, Y. and Traina, S.J. (1996), Oxidation kinetics of Co(II)-EDTA in aqueous and semi-aqueous goethite suspensions. *Environmental Science & Technology*, **30** (6), 1975-1981.

Full Text: [E\Env Sci Tec30, 1975.pdf](E/Env%20Sci%20Tec30,%201975.pdf)

Abstract: The co-disposal of trace metals (e.g., Co), synthetic chelates (e.g., ethylendiaminetetraacetic acid, H4EDTA), and water-miscible organic solvents has occurred at some contamination sites. The present study examines the reactions of Co(II)-EDTA(2-) with a redox reactive naturally occurring solid, goethite, in aqueous and semi-aqueous (methanol-water, acetone-water) suspensions. UV-vis spectroscopy indicated that goethite catalyzed oxidation of Co((II))-EDTA(2-) to Co(lll)-EDTA(-) by dissolved O2. The aeorobic reaction was described by a pseudo-first-order rate constant, k, of 0.0078±0.0002 h-1 at p[H] 5.0 and a goethite concentration of 3.09 g L-1. A decreased oxidation rate under N2(g) purge was caused by an accumulation of Fe(II) in the goethite suspensions. The addition of acetone monotonically increased k. In contrast, methanol additions up to 20 wt % decreased k. Further additions of methanol raised k in excess of that observed for fully aqueous suspensions. These reactions have important implications on the fate of the redox-sensitive metal in complex, mixed waste environments.

Keywords: Migration

? Karanfil, T., Kilduff, J.E., Schlautman, M.A. and Weber, Jr., W.J. (1996), Adsorption of organic macromolecules by granular activated carbon. 1. Influence of molecular properties under anoxic solution conditions. *Environmental Science & Technology*, **30** (7), 2187-2194.

Full Text: [1996\Env Sci Tec30, 2187.pdf](1996/Env%20Sci%20Tec30,%202187.pdf)

Abstract: The adsorption of nine different natural and synthetic macromolecular dissolved organic materials (DOMs) by granular activated carbon (GAG) was investigated under anoxic conditions to elucidate the relative influence of different molecular properties. In particular, attempts were made to better understand the respective roles of DOM molecular size and chemical structure. Anoxic conditions were chosen because of the additional complications caused by the presence of dissolved oxygen, the latter issue is addressed in a companion paper. For a chemically homogeneous model DOM, polystyrene sulfonate (PSS), adsorption was observed to decrease with increasing macromolecular size. Similar results were obtained for three natural humic materials (Laurentian, peat, and Aldrich humic acids) that were fractionated into different size regimes by ultrafiltration. The similarity between the results for PSS and among the various size fractions of each of these three humic acids suggests that the chemistry of humic macromolecules, particularly that which affects adsorption by GAG, is relatively uniform from one fraction to another, and that differences observed in GAC uptake of different fractions can be attributed principally to physical size effects. Examination of the adsorption of additional DOMs isolated from different sources to GAG, however, reveals the importance of chemical structure, particularly the presence of acidic functional groups. The adsorption affinity of GAC for different DOMs was found to correlate directly with the number of acidic functional groups normalized by macromolecule size, up to a limit beyond which further increases in acidity enhanced the solubility of the organic macromolecules too much to allow additional adsorption to occur.

Keywords: Acids, Activated Carbon, Adsorption, Gac, Humic Substances, Matter, Models, Oxygen, Transport

? Karanfil, T., Schlautman, M.A., Kilduff, J.E. and Weber, Jr., W.J. (1996), Adsorption of organic macromolecules by granular activated carbon. 2. Influence of dissolved oxygen. *Environmental Science & Technology*, **30** (7), 2195-2201.

Full Text: [1996\Env Sci Tec30, 2195.pdf](1996/Env%20Sci%20Tec30,%202195.pdf)

Abstract: The influence of dissolved oxygen (DO) on the uptake of natural and synthetic macromolecular dissolved organic materials (DOMs) from aqueous solutions by granular activated carbon (GAG) was investigated. The sorption behaviors of six of the nine DOMs tested were enhanced by the presence of DO, these included polymaleic acid, peat humic acid, Leonardite humic acid, Suwannee River fulvic acid, and Laurentian fulvic and humic acids. The sorptions of Aldrich and soil humic acids and polystyrene sulfonate were not sensitive to the presence or absence of DO. Sensitivity of sorption to DO generally increased with decreasing molecular size, polydispersity, and aromaticity and with increasing acidity for the five natural DOMs. Oxygen-sensitive sorption of the low molecular weight fractions of peat humic acid, a slightly oxygen-sensitive DOM, was noticeably greater than that of the whole material, Sorption of the low molecular weight fractions of Aldrich humic acid, an oxygen-insensitive DOM, did not show any particular sensitivity to oxygen.

Keywords: Activated Carbon, Capacity, Gac, Humic Acid, Matter, Models, Oxygen, Removal, Sorption

Addink, R., Paulus, R.H.W.L. and Olie, K. (1996), Prevention of polychlorinated dibenzo-*p*-dioxins/dibenzofurans formation on municipal waste incinerator fly ash using nitrogen and sulfur compounds. *Environmental Science & Technology*, **30** (7), 2350-2354.

Full Text: [E\Env Sci Tec30, 2350.pdf](E/Env%20Sci%20Tec30,%202350.pdf)

Abstract: Formation of polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans on incinerator fly ash can be reduced under laboratory conditions by the addition of ethylenediaminetetraacetic acid (EDTA), nitrilotriacetic acid (NTA), or Na2S. With these compounds (inhibitors), a reduction in formation of ca. 80-90% is achieved. The inhibitors reduce the ratio of [PCDD]: [PCDF] formed, suggesting that more than one pathway for the formation from carbon exists. EDTA and Na2S reduce the degree of chlorination of PCDD, for PCDF, the same effect is seen with Na2S. No change was ever seen in the isomer distribution within homologues as a result of the inhibitors added, in accordance with the theory that these isomer distributions are thermodynamically controlled. In additional experiments, NTA gave a good reduction with reaction times of 30-60 min, at temperatures between 300 and 400°C, and with concentrations in the reaction mixture of 2-10%. With HCl as a chlorinating agent, the inhibition by NTA is >50% for both PCDD and PCDF. These inhibitors show promising results to achieve the reduction of PCDD/F formation. The additional experiments with NTA show that this compound can reduce formation under various conditions, making it suitable for use in the post-combustion zone of an incinerator, where reaction conditions will vary.

Keywords: Dioxin Formation, Inhibition, PCDD/PCDF, Mechanism, Carbon

Thomas, R.A.P. and Macaskie, L.E. (1996), Biodegradation of tributyl phosphate by naturally occurring microbial isolates and coupling to the removal of uranium from aqueous solution. *Environmental Science & Technology*, **30** (7), 2371-2375.

Full Text: [E\Env Sci Tec30, 2371.pdf](E/Env%20Sci%20Tec30,%202371.pdf)

Abstract: Tributyl phosphate (TBP) is widely used as a solvent and plasticizer with a special use as a solvent for the extraction of uranium and plutonium from other radionuclides in nuclear fuel reprocessing. Although the biodegradation of alkyl phosphates by microorganisms has been noted in the literature, biodegradation of TBP is little-documented. The proposed products of the degradation are potentially useful, the liberated l-butanol as a biomass growth substrate and the co-released inorganic phosphate moiety as a ligand that can precipitate with heavy metals to retain these as biominerals on the biomass. Microorganisms growing on TBP were isolated from industrially contaminated sites and from laboratory enrichment cultures. A mixed culture, containing *Pseudomonas* spp., supported the deposition of heavy metal (uranyl) phosphate and the removal of the latter from solution (biodecontamination). This general biocatalytic approach has been reported previously, these new isolates show potential for the simultaneous treatment of two classes of waste: the breakdown of one waste (TBP) could be harnessed to the treatment of another class of waste (heavy metals) This approach would represent a considerable advance over established bioprocesses for metal removal, where the cost of the addition of exogenous organophosphate substrate (phosphate donor for the metal precipitation reaction) may ultimately limit their use.

Keywords: Citrobacter Sp, Bioaccumulation, Streams

Nowack, B., Lützenkirchen, T., Behra, P. and Sigg, L. (1996), Modeling the adsorption of metal-EDTA complexes onto oxides. *Environmental Science & Technology*, **30** (7), 2397-2405.

Full Text: [E\Env Sci Tec30, 2397.pdf](E/Env%20Sci%20Tec30,%202397.pdf)

Abstract: The adsorption of metal-EDTA complexes onto various oxides (aluminium oxides, crystalline and amorphous iron oxides) was described by the surface complexation model. Data from the literature and from our experiments with several oxides were analyzed by assuming only one type of ternary surface complex for Me(2+)-EDTA complexes. The surface complexes exhibit an anionic character with decreasing adsorption with increasing pH. This proposed model allows us to describe all available data sets very well. The adsorption of NiEDTA was interpreted by several models (constant capacitance, diffuse layer) onto different oxides (with different pK (a) values). Log K values within one model agree very well with each other. The pH, where 50% of the complex is adsorbed, increases in the series HFO < lepidocrocite < gamma-Al2O3 < goethite < delta-Al2O3 from 6.5 to 8.35 (for 1 µM NiEDTA and 1 mM surface groups). Adsorption of Fe(III)EDTA onto several oxides was studied. Two types of surface complexes, anionic and cationic, were necessary to explain the observed adsorption edge. Fe(III)EDTA is adsorbed over a wide pH range and is the major adsorbed EDTA species at pH greater than 7.

Notes: highly cited

Xing, B.S., Pignatello, J.J. and Gigliotti, B. (1996), Competitive sorption between atrazine and other organic compounds in soils and model sorbents. *Environmental Science & Technology*, **30** (8), 2432-2440.

Full Text: [E\Env Sci Tec30, 2432.pdf](E/Env%20Sci%20Tec30,%202432.pdf)

Abstract: This is part of a larger study that addresses the question of whether site-specific sorption of organic compounds takes place in soil organic matter(SOM). Competitive sorption is one indication that such interactions may take place. Competitive sorption was tested between atrazine (AT) and other co-solutes in water suspensions of natural and model sorbents. The co-solutes included several s-triazine analogs, a substituted benzene analog (5-chloro-1,3-dimethoxybenzene), and a dissimilar compound, trichloroethene (TCE). The sorbents included a mineral soil (3% OM), a peat soil (93% OM), soil humic acid particles (99% OM), rubbery polymers (polyethylene, cellulose, chitin), a glassy polymer [poly(2,6-diphenyl-p-phenylene oxide)], and a mesoporous silica gel. The rubbery polymers afforded linear single-solute isotherms and no competition, both consistent with ideal (Henry’s law) partition sorption. The other sorbents, including the glassy polymer, gave nonlinear single-solute isotherms and significant competition between AT and its analogs and weak or no competition between AT and TCE. A thermodynamic model, ideal adsorbed solution theory (IAST), was incapable of consistently simulating competition or lack thereof. For the SOM-containing materials, the results indicate that, like glassy polymers, SOM is a dual-mode sorbent. Sorption occurs by a partition mechanism and a hole-filling mechanism. The holes are conceptualized as specific sites inside the matrix where complexation follows the Langmuir isotherm and where a degree of specificity is exhibited. In the mineral and peat Soils, from one-third to one-half of AT sorption occurs in the hole domain. Combined with previous data, it appears that dual-mode sorption in SOM is applicable to polar and nonpolar compounds alike. For silica, the results suggest that the spatial sorption domain of TCE is distinct (possibly further from the surface) than that of the s-triazines.

Keywords: Distributed Reactivity Model, Aqueous-Solutions, Humic Substances, Glassy-Polymers, Adsorption, Transport, Sediments, Desorption, Montmorillonite, Thermodynamics

Crist, R.H., Martin, J.R., Chonko, J. and Crist, D.R. (1996), Uptake of metals on peat moss: An ion-exchange process. *Environmental Science & Technology*, **30** (8), 2456-2461.

Full Text: [E\Env Sci Tec30, 2456.pdf](E/Env%20Sci%20Tec30,%202456.pdf)

Abstract: Various biomaterials have shown promise as sorbants to remove heavy metals from water. Several advantages of peat moss for such applications include its abundance, low cost and high metal capacity. A Ca-loaded column of peat moss was therefore studied with mixtures of metals. Metals bind to anionic sites by displacing protons from acidic groups (K-ex (H)) or existing metals from anionic sites at high pH (K-ex). These ion-exchange equilibrium constants were determined in batch experiments by direct measurement of species in solution and sorbed on the solid phase. The same K-ex values of Mg 0.342, Mn 0.862, Ca 1.00, Ni 1.42, Zn 1.88, Cd 2.82, Cu 9.97 and Pb 26.7 relative to Ca were found for a given metal alone or in the presence of a mixture, thus showing that the metals function independently. Under conditions employed for a Mg/Mn mixture, it was found that ion-exchange equilibria were maintained along the column due to very fast rates for metal-metal exchange as measured in a separate kinetic study. A linear relationship for log K-ex (H) vs pH over 10 (6) was interpreted as due to metal binding to sites of different acid strengths.

Keywords: Heavy-Metals, Peat, Adsorption, Equilibria, Soils, Acid

Wittbrodt, P.R. and Palmer, C.D. (1996), Effect of temperature, ionic strength, background electrolytes and Fe(III) on the reduction of hexavalent chromium by soil humic substances. *Environmental Science & Technology*, **30** (8), 2470-2477.

Full Text: [E\Env Sci Tec30, 2470.pdf](E/Env%20Sci%20Tec30,%202470.pdf)

Abstract: The rate of hexavalent chromium reduction by soil humic substances (SHSs) was investigated in aqueous solutions where the temperature, ionic strength, background electrolyte, [Fe(III)], and [Cr(III)] were independently varied. Rate experiments were conducted with an excess of SHS over Cr(VI). An Arrenhius plot for the reduction of Cr(VI) by a soil fulvic acid and a soil humic acid indicates that the activation enthalpies for oxidation of these substances are nearly the same (63±1 and 61±3 kJ mol-1, respectively) and the activation entropies are significantly different (-160±5 and-203±9 J mol-1 K-1, respectively). Rates of reduction are not significantly altered due to changes in either background electrolyte or ionic strength. The presence of Cr(III) slightly inhibits the rate of reduction by soil humic acid, but not that of soil fulvic acid. Ferric iron increases the rats of Cr(VI) reduction, even when only a small amount of Fe(III) is added to the system. Fe may enhance the reduction of Cr(VI) by being alternately reduced by the SHS and then oxidized by the Cr(VI) as part of a redox cycle. The reduction of FeCrO4+ complexes via a parallel reaction pathway may also enhance Cr(VI) reduction in the Cr-Fe-SHS system.

Keywords: Fulvic-Acid, Chromate, Solubility, Hydroxide, Oxidation, Behavior, Cr(VI)

Pennise, D.M. and Kamens, R.M. (1996), Atmospheric behavior of polychlorinated dibenzo-p-dioxins and dibenzofurans and the effect of combustion temperature. *Environmental Science & Technology*, **30** (9), 2832-2842.

Full Text: [E\Env Sci Tec30, 2832.pdf](E/Env%20Sci%20Tec30,%202832.pdf)

Abstract: Emissions from the combustion of wood chips treated with pentachlorophenol (PCP), polyvinyl chloride (PVC) plastic pipe shavings, and solid PCP were injected into 25-m3 outdoor Teflon film chambers and aged in sunlight under typical atmospheric conditions. The behavior of particulate and gas-phase polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDDs and PCDFs) and polycyclic aromatic hydrocarbons (PAHs) was monitored over time. Only the tetra- and pentachlorinated dioxins and furans were shown to clearly partition at all into the gas phase in these experiments, perhaps due to high concentrations of TSP. Little or no reactivity was observed for PCDDs and PCDFs residing on particles resulting from high-temperature combustion (760-800°C). Greater photochemical reactivity of particle-bound PCDD/Fs resulted after low-temperature combustion (350-380 PC), where fairly rapid photolysis competed with a production mechanism believed to begin with PCP. Photolysis rates of PCD D/Fs appeared to increase with decreasing levels of chlorination, lending evidence to the observed enrichment of the higher chlorinated species in the natural environment. On low-temperature combustion particles, model results showed that TCDD half-lives increased from 0.4 under North Carolina summer outdoor conditions to 17 h under wintertime conditions. For high-temperature combustion particles under similar outdoor conditions, half-lives ranged from 6.8 to 62 h. For these same conditions, model OCDD half-lives increased from 5 and 38 h in low-temperature combustion experiments to 36 and 257 h in high-temperature combustion experiments. Experimental particle-phase PAH photolytic half-lives also increased from between 0.1 and 3.6 h in low-temperature combustion experiments to between 4.4 h and stability on high-temperature combustion particles. These differ-ences may be explained by differences in the particles generated from low- and high-temperature combustion.

Keywords: Polycyclic Aromatic-Hydrocarbons, Coal Stack Ash, Photochemical Transformation, Fly-Ash, Chlorinated Dioxins, Organic-Compounds, Vapor-Pressures, Photolysis, Pyrene, Soils

Schiewer, S. and Volesky, B. (1996), Modeling multi-metal ion exchange in biosorption. *Environmental Science & Technology*, **30** (10), 2921-2927.

Full Text: [E\Env Sci Tec30, 2921.pdf](E/Env%20Sci%20Tec30,%202921.pdf)

Abstract: Some types of dead microbial or seaweed biomass are capable of effectively binding heavy metals often through ion exchange. This biosorption can be used for purification of metal-bearing effluents. A recently developed two-site model for the ion exchange between divalent metal ions and protons in biosorption was extended to describe multi-site and multi-ion system behavior. A model case for two ion exchange sites and three ions was compared to the experimental data for the sorption of Cd, Cu and Zn by protonated *Sargassum* fluitans biomass in systems containing two metal ions and protons at different pH values. The equilibrium constants were comparable to those obtained for systems where, in addition to protons, only one metal ion was present. This opens the possiblity of predicting the sorption performance for three-cation systems from equilibrium constants determined in two-cation systems. There was no interference between the sorbed species except for competition for the same sorption sites. The model was able to predict the equilibrium binding of all three ions as a function of pH and of the final metal concentrations. Only two equilibrium constants, which were valid for any pH and in the presence of any competing ion, were necessary for predicting the binding of each metal ion. The complete equilibrium state (final concentration and binding) can be predicted as a function of the initial state for a pH titration in the simultaneous presence of two metal ions when the equilibrium constants are used in the chemical equilibrium program MINEQL +.

Huang, W.L., Schlautman, M.A. and Weber, Jr., W.J. (1996), A distributed reactivity model for sorption by soils and sediments. 5. The influence of near-surface characteristics in mineral domains. *Environmental Science & Technology*, **30** (10), 2993-3000.

Full Text: [E\Env Sci Tec30, 2993.pdf](E/Env%20Sci%20Tec30,%202993.pdf)

Abstract: Phenanthrene sorption by eight particulate mineral solids was examined. The polar surfaces of these inorganic solids comprised three general types with respect to particle structure, namely, (i) the *external surfaces* of non-porous α-Al2O3, quartz, kaolinite, and amorphous SiO2, (II) the *internal pore surfaces* of three mesoporous silica gels, and (iii) the *internal interlayer surfaces* of a swelling bentonite clay. Our experimental data reveal that (i) equilibrium is attained rapidly for all sorbents studied, (II) the isotherms for all sorbents other than the bentonite are linear, and (iii) the external surfaces have surface-area-based sorption coefficients that are comparable to those of the interlayer surfaces of bentonite at high residual aqueous-phase concentrations, but an order of magnitude greater than those for the internal pore surfaces. The differences in sorption behavior exhibited by the three types of surfaces appear to result from differences in their relative accessibility to the sorbate, as affected by near-surface particle or pore geometry and by the preferential sorption of water molecules. The results suggest that the slow rates of sorption of hydrophobic organic contaminants often observed for soils and sediments is likely attributable to processes other than solute diffusion to “sorption sites” on internal mineral surfaces.

Keywords: Adsorption, Aquifer Material, Desorption, Diffusion, Equilibrium, Halogenated Organic-Chemicals, Hydrophobic Organic Contaminants, Long-Term Sorption, Sorption, Subsurface Systems, Transport, Unsaturated Conditions

Farmer, J.G., Eades, L.J., Mackenzie, A.B., Kirika, A. and Bailey-Watts, T.E. (1996), Stable lead isotope record of lead pollution in Loch Lomond sediments since 1630 A.D. *Environmental Science & Technology*, **30** (10), 3080-3083.

Full Text: [E\Env Sci Tec30, 3080.pdf](E/Env%20Sci%20Tec30,%203080.pdf)

Abstract: Stable lead isotope data can yield information on the geochemical origins of lead and on its relative contributions from sources such as coal burning, mining, smelting, and car-exhaust emissions. This extremely detailed Pb-206/Pb-207 profile for dated bottom sediments in Loch Lomond, Scotland, shows the trends clearly related to the varying nature and extent of anthropogenic lead inputs after 1630. In particular, a significant decline in the Pb-206/Pb-207 ratio of excess lead during 1929-1991 is attributable to the introduction and use of (Pb-206-depleted) leaded petrol since the 1920s. This accounts, however, for just 24-53% of the excess lead deposited since 1929 and less than or equal to 19% of the total excess lead inventory. Deposition of lead from industrial (and domestic) activities has predominated overall and, on an annual basis, until at least the mid-1950s.

Keywords: Atmospheric Lead, Identification, Environment, Ratios, Water, Pond, Tarn

Huang, M., Tso, E., Datye, A.K., Prairie, M.R. and Stange, B.M. (1996), Removal of silver in photographic processing waste by TiO2-based photocatalysis. *Environmental Science & Technology*, **30** (10), 3084-3088.

Full Text: [E\Env Sci Tec30, 3084.pdf](E/Env%20Sci%20Tec30,%203084.pdf)

Abstract: Treatability data on actual waste show that titania-based photocatalysis can be used to remove silver ions from black and white photoprocessing waste. The silver ion is reduced to its metallic form producing particles comparable in size to the TiO2 catalyst particles. The mass of silver recovered approaches three times that of the titania. Thiosulfate (the predominant chemical in spent fixer) plays a complicated role in the process of silver ion reduction: (1) as a hole scavenger, it can increase the silver reduction rate, (2) as the chemical that stabilizes silver ion in solution, thiosulfate hinders photocatalysis when present at high concentration. Metallic silver can be separated from titania by the physical process of sonication. We also show that sunlight can be used directly to power the photo-electrochemical silver removal process.

Keywords: Recovery

Alcock, R.E. and Jones, K.C. (1996), Dioxins in the environment: A review of trend data. *Environmental Science & Technology*, **30** (11), 3133-3143.

Full Text: [E\Env Sci Tec30, 3133.pdf](E/Env%20Sci%20Tec30,%203133.pdf)

Abstract: A comprehensive review of available PCDD/F time trend data is presented. This focuses on industrialized countries, drawing heavily on those countries that have been actively involved in PCDD/F monitoring and research, notably Germany, the United States, Sweden, The Netherlands, and the U.K. Information on temporal trends comes from the analysis of date-able deposits (e.g., sediments), retrospective analysis of preserved or archived samples, and ongoing monitoring programs. The data on changes in air concentrations, deposition, sediments, soil, biota, food, and human tissues are reviewed. The evidence for natural input/formation of PCDD/Fs is also briefly reviewed and discussed. Human activity has dominated PCDD/F inputs to the environment this century. Conceptually, it is probably appropriate to consider a ‘pulse’ of PCDD/Fs arising from human activities entering the environment in the 1930/1940s, peaking in the 1960/1970s, and continuing to a lesser degree today. A series of measures introduced in the past, recently, and anticipated for the future have reduced emissions to the atmosphere of industrialized countries and are projected to continue to reduce emissions over the coming decade. Comprehensive monitoring programs are required to confirm the interpretation of past changes and projected future declines presented here.

Keywords: Dibenzo-p-Dioxins, Human Adipose-Tissue, Polychlorinated-Biphenyls PCBs, Pattern-Recognition Techniques, Human-Milk, Organic-Chemicals, United-Kingdom, Sewage-Sludge, Organochlorine Pesticides, Chlorinated Dioxins

Jakob, A., Stucki, S. and Struis, R.P.W.J. (1996), Complete heavy metal removal from fly ash by heat treatment: Influence of chlorides on evaporation rates. *Environmental Science & Technology*, **30** (11), 3275-3283.

Full Text: [E\Env Sci Tec30, 3275.pdf](E/Env%20Sci%20Tec30,%203275.pdf)

Abstract: Thermal treatment is a promising way for the decontamination and inertization of residues from waste incineration. The evaporation of heavy metal compounds thereby is of great significance. It is the goal of this work to identify, by analyzing evaporation rates, the predominant thermochemical reactions of the heavy metals with other constituents of fly ash, with respect to volatilization. To this end, experiments were performed with fly ash from a municipal solid waste (MSW) incineration plant as well as with synthetic powder mixtures in the temperature range of 670-1000℉. The rates of Cd, Cu, Pb and Zn evaporation can be described accurately by a simple first-order rate law and a rate coefficient which itself follows an exponential temperature dependence analogous to the Arrhenius equation. The degrees (completeness) as well as the rates of evaporation of the heavy metals are markedly influenced by chlorides contained in the fly ash, largely as NaCl. Experiments with model substrates indicate that the heavy metals Zn and Cu in fly ash, which are the least volatile among the group investigated, are predominantly present as chlorides. Their evaporation is completed by shifting the oxide/chloride equilibrium if surplus chlorine, e.g., in the form of NaCl, is available. The heavy metal evaporations are probably limited by reactions that form heavy metalsilica/alumina compounds.

Keywords: Alkali Removal, Flue-Gases, Sorbents

Johnson, J. (1996), Research, regulations spur development of new CEM incinerator technologies. *Environmental Science & Technology*, **30** (11), A477-A478.

Brzuzy, L.P. and Hites, R.A. (1996), Response to comment on “Global mass balance for polychlorinated dibenzo-p-dioxins and dibenzofurans”. *Environmental Science & Technology*, **30** (12), 3647-3648.

Full Text: [E\Env Sci Tec30, 3647.pdf](E/Env%20Sci%20Tec30,%203647.pdf)

Keywords: Chlorinated Dioxins, Deposition, Furans, PCDDs, PCDFs

Notes: highly cited

? Bosma, T.N.P., Middeldorp, P.J.M., Schraa, G. and Zehnder, A.J.B. (1997), Mass transfer limitation of biotransformation: Quantifying bioavailability. *Environmental Science & Technology*, **31** (1), 248-252.

Full Text: [1996\Env Sci Tec31, 248.pdf](1996/Env%20Sci%20Tec31,%20248.pdf)

Abstract: Biotransformation is controlled by the biochemical activity of microorganisms and the mass transfer of a chemical to the microorganisms. A generic mathematical concept for bioavailability is presented taking bath factors into account. The combined effect of mass transfer of a substance to the cell and the intrinsic activity of the cell using the substance as primary substrate, is quantified in a bioavailability number (Bn). The concept can easily be extended to secondary substrates. The approach has been applied to explain the observed kinetics of the biotransformation of organic compounds in soil slurries and in percolation columns. The model allowed us to predict threshold concentrations below which no biotransformation is possible. Depending on the environmental system and the chemical involved, predicted threshold concentrations span a range of 11 orders of magnitude from nanograms to grams per liter and match with published experimental data. Mass transfer-and not the intrinsic microbial activity-is in most cases the critical factor in bioremediation.

Keywords: Aerobic Biomineralization, Alpha-Hexachlorocyclohexane, Bioavailability, Biodegradation, Biological Processes, Bioremediation, Degradation, Diffusion, Growth Kinetics, Kinetics, Mass Transfer, Polycyclic Aromatic-Hydrocarbons, Soil, Sorption

Notes: highly cited

? Carmichael, L.M., Christman, R.F. and Pfaender, F.K. (1997), Desorption and mineralization kinetics of phenanthrene and chrysene in contaminated soils. *Environmental Science & Technology*, **31** (1), 126-132.

Full Text: [1996\Env Sci Tec31, 126.pdf](1996/Env%20Sci%20Tec31,%20126.pdf)

Abstract: The relative rates of desorption and mineralization for spiked concentrations of [C-14]phenanthrene and [C-14]chrysene preloaded on two previously contaminated soils (f(oc), 0.029 and 0.0026) were investigated using static, slurry phase microcosms (V-water/V-soil = 10) Desorption rates of [C-14]phenanthrene and [C-14]chrysene preloaded on the contaminated soils were much faster than observed mineralization rates, whereas the desorption rates of native polynuclear aromatic hydrocarbons (PAH) in the higher organic content contaminated soil were equal to or slower than mineralization rates. This suggests that the desorption of aged PAH may control their degradation and may explain the persistence of PAH even in soils containing a large and active community of PAH-degrading microorganisms. In addition, using C-14-spiked PAH in contaminated soils to measure desorption and biodegradation rates may lead to misleading interpretations of the environmental fate of soil-bound polynuclear aromatic hydrocarbons.

Keywords: Adsorption, Bioavailability, Biodegradability, Contaminated Soil, Degradation, Desorption, Equilibria, Ionic Organic-Compounds, Kinetics, Lead, Mineralization, Natural Sediments, Pollutants, Polycyclic Aromatic-Hydrocarbons, Soils, Sorption, Water

? Gustafsson, O., Haghseta, F., Chan, C., MacFarlane, J. and Gschwend, P.M. (1997), Quantification of the dilute sedimentary soot phase: Implications for PAH speciation and bioavailability. *Environmental Science & Technology*, **31** (1), 203-209.

Full Text: [1997\Env Sci Tec31, 203.pdf](1997/Env%20Sci%20Tec31,%20203.pdf)

Abstract: Existing field data indicate that soot may significantly affect the environmental speciation of polycyclic aromatic hydrocarbons (PAHs). To expand hydrophobic partition models to include soot partitioning, we need to quantify f(sc), the soot fraction of the solid matrix, and K-sc, the soot-carbon-normalized partition coefficient. To this end, we have developed a method that allows quantification of soot carbon in dilute and complex sedimentary matrices. Non-soot organic carbon is removed by thermal oxidation, and inorganic carbonates are removed by acidification, followed by CHN elemental analysis of the residual soot carbon. The selectivity of the soot carbon method was confirmed in tests with matrices of known compostion. The soot quantification technique was applied to two sets of natural sediments, both previously analyzed for PAHs. The input histories of PAHs and soot recorded in a lacustrine sediment core followed the same general trends, and we thus infer a coupling between the two. Our measures of f(sc) and calculations of K-sc, approximated from studies of PAH sorption onto activated carbon, were applied to rationalize previously generated in situ K(oc)values. Intriguingly, we find that the elevated PAH K-d Values of two marine sediment-porewater systems are now quantitatively explainable through the extended, soot-partioning inclusive, distribution model, The importance of the soot phase for PAHs in the environment has implications fbr how we perceive (and should test) in situ bioavailability and, consequently, also for the development of sediment quality criteria.

Keywords: Polycyclic Aromatic-Hydrocarbons, Fossil-Fuel Combustion, Hydrophobic Pollutants, Partition-Coefficients, Carbonaceous Particles, Natural Sediments, Elemental Carbon, Organic-Carbon, United-States, Water

Johnson, J. (1997), Hazardous waste incinerator rule delayed by EPA for more than a year. *Environmental Science & Technology*, **31** (2), A78-A79.

Notes: highly cited

Fendorf, S., Eick, M.J., Grossl, P. and Sparks, D.L. (1997), Arsenate and chromate retention mechanisms on goethite. 1. Surface structure. *Environmental Science & Technology*, **31** (2), 315-320.

Full Text: [E\Env Sci Tec31, 315.pdf](E/Env%20Sci%20Tec31,%20315.pdf)

Abstract: The molecular structure of ions retained on mineral surfaces is needed to accurately model their sorption process and to determine their stability. Extended X-ray absorption fine structure (EXAFS) spectroscopy was used in this study to deduce the local coordination environment of two environmental contaminants, arsenate and chromate, on the mineral goethite (alpha-FeOOH). Based on the oxyanion-Fe distances, it was concluded that three different surface complexes exist on goethite for both oxyanions: a monodentate complex, a bidentate-binuclear complex, and a bidentate-mononuclear complex. At low surface coverages, the monodentate complex was favored while at higher coverages the bidentate complexes were more prevalent-the bidentate-binuclear complex appears to be in the greatest proportion at these highest surface coverages. Therefore, modeling efforts for chromate or arsenate retention on goethite need to consider a monodentate complex at very low coverages, both the monodentate and bidentate complexes at intermediate coverages, and predominantly the bidentate complexes at very high coverages.

Keywords: Absorption Fine-Structure, Phosphate Adsorption, Chromium

Grossl, P.R., Eick, M., Sparks, D.L., Goldberg, S. and Ainsworth, C.C. (1997), Arsenate and chromate retention mechanisms on goethite. 2. Kinetic evaluation using a pressure-jump relaxation technique. *Environmental Science & Technology*, **31** (2), 321-326.

Full Text: [E\Env Sci Tec31, 321.pdf](E/Env%20Sci%20Tec31,%20321.pdf)

Abstract: The kinetics of arsenate and chromate adsorption/desorption on goethite (alpha-FeOOH) were investigated using a pressure-jump (p-jump) relaxation technique, information provided by this technique was used to elucidate the fate of arsenate and chromate in natural environments. Chemical relaxations resulting from rapidly induced pressure changes were monitored via conductivity detection. The adsorption/desorption of these oxyanions on goethite involved a double relaxation event. The proposed mechanism far the adsorption of arsenate and chromate on goethite is a two-step process resulting in the formation of an inner-sphere bidentate surface complex. The first step, associated with the fast tau values, involved an initial ligand exchange reaction of aqueous oxyanion species H2AsO4- or HCrO4- with OH ligands at the goethite surface forming an inner-sphere monodentate surface complex. The subsequent step, associated with the slow tau values, involved a second ligand exchange reaction, resulting in the formation of an inner-sphere bidentate surface complex. Overall, the results suggest that chromate may be the more mobile of the two oxyanions in soil systems.

Keywords: Adsorption-Desorption, Oxide Minerals, Phosphate, Model

Wang, F.Y., Chen, J.S. and Forsling, W. (1997), Modeling sorption of trace metals on natural sediments by surface complexation model. *Environmental Science & Technology*, **31** (2), 448-453.

Full Text: [E\Env Sci Tec31, 448.pdf](E/Env%20Sci%20Tec31,%20448.pdf)

Abstract: The potential possibility of the surface complexation models to describe the sorption of trace metals on natural sediments has been suggested since the late 1980s, which should be of natural importance to predict the bioavailability of trace metals in aquatic sediments. This possibility was tested based on 11 geographically and hydrologically diverse natural aquatic sediment samples. The sorption of Cu(II), Zn(II), Pb(II), and Cd(II) on these sediments was studied by both sorption isotherm and pH-edge sorption experiments. The experimental sorption data were fit well by the surface complexation model(the double-layer model). The linear free energy relationship (LFER) between the surface complexation constants (K-s) of trace metals on the sediments and the corresponding first-hydrolysis constants (K-\*(1)) was observed, which could be expressed as log K-s = a log K-\*(1) + b. The slope of the linear regression, a, was dependent on the sediment composition: a = 0.19TOC - 0.09Oxides + 1.31 (n = 11), where TOC (%) is the total organic carbon and Oxides (%) include reactive iron oxide, amorphous iron oxide, cryptocrystalline manganese oxide, and aluminum oxide. The results strongly suggest that the sorption of trace metals on natural sediments could be described reasonably by the surface complexation model and predicted potentially from the relationships between K-s and K-\*(1) and the sediment composition.

Keywords: Electrical Double-Layer, Oxide-Water Interface, Dissolution, Copper, Lead, Zinc

Notes: highly cited

? Cornelissen, G., VanNoort, P.C.M., Parsons, J.R. and Govers, H.A.J. (1997), Temperature dependence of slow adsorption and desorption kinetics of organic compounds in sediments. *Environmental Science & Technology*, **31** (2), 454-460.

Full Text: [1997\Env Sci Tec31, 454.pdf](1997/Env%20Sci%20Tec31,%20454.pdf)

Abstract: The purpose of the present study was to determine the temperature dependence of slow adsorption and desorption kinetics of some chlorobenzenes, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs) in a lab-contaminated and a field-contaminated sediment. The kinetics of desorption were measured by means of a technique in which Tenax TA beads are used as “sink” for desorbed solute. A first-order kinetic model with three sediment compartments described the desorption of the test compounds from the sediments. Apart from a rapidly desorbing fraction, two sediment fractions were distinguished, one slowly desorbing with a rate constant of (1-4)×10-3 h-1 and a very slowly desorbing one with rate constants approximately 10-50 times smaller. From temperature dependence studies, the a activation enthalpies for slow desorption appeared to be 60-70 kJ mol-1 for both the lab-contaminated and the field-contaminated sediments; the values were approximately constant for all compounds studied. From adsorption studies at two temperatures, enthalpies of sorption to the slow sediment compartment appeared to be slightly negative. Because slow desorption is much faster al elevated temperatures, the measurement of high-temperature desorption kinetics can provide information on long-term desorption kinetics and, probably, on the feasibility of bioremediation of aged contaminants.

Keywords: Activation, Adsorption, Bioremediation, Chemicals, Desorption, Diffusion, Kinetics, Natural Sediments, Nonequilibrium Sorption, Sediments, Soils, Sorption, Transport, Water

Yin, Y.J., Allen, H.E., Huang, C.P., Sparks, D.L. and Sanders, P.F. (1997), Kinetics of mercury(II) adsorption and desorption on soil. *Environmental Science & Technology*, **31** (2), 496-503.

Full Text: [E\Env Sci Tec31, 496.pdf](E/Env%20Sci%20Tec31,%20496.pdf)

Abstract: Adsorption and desorption kinetics of Hg(II) on four sails at pH 6 were investigated to discern the mechanisms controlling the retention and release reaction rates of Hg(II) on soil. A stirred-flow method was employed to perform experiments. Apparent adsorption and desorption rate coefficients were determined by a one-site second-order kinetic model. Both adsorption and desorption were characterized by a biphasic pattern, a fast step followed by a slow step. After 2 min, the Hg(II) adsorbed for an 8 mgL-1 influent accounted for 4-38% of the total Hg(II) adsorbed within 5 h. of the Hg(II) released within 8 h, 62-81% was desorbed during the first 100 min. Both adsorption and desorption rate coefficients were inversely correlated with the sail organic C content Not all adsorbed Hg(II) was readily released. The greater the sail organic C content, the higher the fraction of Hg(II) that was resistant to desorption. The diffusion of Hg(II) through intraparticle micropores of soil organic matter may be the principal factor responsible for the observed irreversibility. In addition, the binding of Hg(II) to high affinity sites on soil organic matter, such as the S-containing (-S) groups, may also be important to Hg(II) persistence in soils.

Keywords: Sorption, Cadmium, Displacement, Retention, Goethite, Chamber, Model

Jin, Y., Yates, M.V., Thompson, S.S. and Jury, W.A. (1997), Sorption of viruses during flow through saturated sand columns. *Environmental Science & Technology*, **31** (2), 548-555.

Full Text: [E\Env Sci Tec31, 548.pdf](E/Env%20Sci%20Tec31,%20548.pdf)

Abstract: Viruses pathogenic to humans have been found in wells and drinking water doe to the improper placement of wastewater disposal operations (e.g., septic tanks, wastewater infiltration basins) and inadequate removal of the organisms as the wastewater percolated through the soil. In order to develop well head protection criteria that are protective of public health, it is necessary to understand the mechanisms that control virus retention and removal in porous media. In this study, we report the results of a series of experiments on virus transport through sand columns (9.2 cm in diameter and 10.5 or 20 cm long) under saturated-flow conditions. Two bacteriophages, MS-2 and phi X-174, were used in the experiments. Virus solution was applied to the lower end of the column as a constant input, and samples were collected at the effluent end. A virus transport and fate model, partially calibrated with the transport parameters obtained from Br-tracer experiments, was used to evaluate the retention and inactivation characteristics of the viruses. We found that, while MS-2 was not sorbed by the Ottawa sand, a significant amount of the applied phi X-174 was retained but not inactivated in the columns. This was probably due to the difference in their isoelectric points. Retention of phi X-174 exhibited trends consistent with first-order attenuation that increased with residence time, however, the sand was found to have a finite sorption capacity for phi X-174. This study also demonstrates that virus sorption can be evaluated more effectively with a well-controlled column flow system than by the commonly used batch equilibration method.

Keywords: Porous-Media, Bacteriophage Transport, Chemical Perturbations, Unsaturated Flow, United-States, Soil Columns, Adsorption, Poliovirus, Removal, Deposition

Chen, X.B., Wright, J.V., Conca, J.L. and Peurrung, L.M. (1997), Effects of pH on heavy metal sorption on mineral apatite. *Environmental Science & Technology*, **31** (3), 624-631.

Full Text: [E\Env Sci Tec31, 624.pdf](E/Env%20Sci%20Tec31,%20624.pdf)

Abstract: The sorption of aqueous Pb, Cd and Zn onto a mineral apatite from North Carolina was investigated in relation to a wide range of pH. The effects of pH on solid-phase precipitation were particularly emphasized. The heavy metals were applied as single or multiple species. Solution pH greatly affected metalsorption mechanism by apatite and metal-apatite reaction products. The sorption of aqueous Pb was primarily through a process of the dissolution of apatite followed by the precipitation of variable pyromorphite-type minerals under acidic condition or of hydrocerussite [Pb3(CO3)2(OH)2] and lead oxide fluoride (Pb2OF2) under alkaline condition. Otavite (CdCO3), cadmium hydroxide [Cd(OH)2] and zincite (ZnO) were formed in the Cd or Zn system, especially under alkaline condition, while hopeite [Zn3(PO4)24H2O] might precipitate only under very acidic condition. Alternative sorption mechanisms other than precipitation of the crystalline phases were important in reducing Cd and Zn concentrations by the apatite and might include ion exchange, adsorption, absorption, complexation, coprecipitation, or precipitation of amorphous phases. Removal of Cd and Zn by the apatite was pH dependent, whereas removal of Pb was not. The removals were about 0.729 mmol of Pb, 0.489-1.317 mmol of Cd and 0.596-2.187 mmol of Zn/g of apatite, representing removal of 99.9%, 37.0-99.9% and 27.0-99.9% of heavy metals from solution, respectively.

Keywords: Inorganic Cation-Exchangers, Synthetic Hydroxyapatites, Lead Immobilization, Aqueous-Solutions, Phosphate Rocks, Calcium Hydroxyapatite, Solubility Product, Soil-pH, Adsorption, Ions

Bose, P. and Reckhow, D.A. (1997), Modeling pH and ionic strength effects on proton and calcium complexation of fulvic acid: A tool for drinking water-NOM studies. *Environmental Science & Technology*, **31** (3), 765-770.

Full Text: [E\Env Sci Tec31, 765.pdf](E/Env%20Sci%20Tec31,%20765.pdf)

Abstract: It is widely recognized that organic charge and metal complexation by natural organic matter (NOM) is critical to a wide range of adsorption and precipitation technologies used for the removal of NOM during water treatment. Due to a variety of analytical limitations, these properties are frequently measured under conditions that are not typical of water treatment system (e.g., high ionic strength). In this paper a mathematical model, similar to one described in Bartschat at al. (Environ. Sci. Technol. 1992, 26, 284-294) has been used to describe (A) the effect of ionic strength on proton complexation of fulvic acid and (B) the effect of pH and ionic strength on the calcium complexation of fulvic acid. The model incorporates molecular size information by assuming these molecules to be impenetrable spheres of some experimentally determined average size. It also incorporates electrostatics by using the Poisson-Boltzmann equation to calculate the surface potential of the average size molecules. The model described here can be calibrated with data from conventional methods used to characterize NOM. It can then be used to extrapolate behavior with respect charge, proton, and calcium complexation to conditions typical of dilute drinking waters. Full calibrations are reported for two aquatic fulvic acids: one based on a new data set, and one based on the work of Dempsey.

Keywords: Simple Electrostatic Model, Humic Substances, Cation Binding, Heterogeneity

Cains, P.W., McCausland, L.J., Fernandes, A.R. and Dyke, P. (1997), Polychlorinated dibenzo-p-dioxins and dibenzofurans formation in incineration: Effects of fly ash and carbon source h. *Environmental Science & Technology*, **31** (3), 776-785.

Full Text: [E\Env Sci Tec31, 776.pdf](E/Env%20Sci%20Tec31,%20776.pdf)

Abstract: Research aimed at understanding polychlorinated dibenzo-p-dioxin (PCDD) and dibenzofuran (PCDF) formation in combustion and incineration processes constitutes an important component in developing strategies for controlling their emission. Incinerator ashes from six different process sources have been examined and characterized in terms of their behavior with respect to PCDD/F formation in laboratory experiments. The effects of varying the carbon content of one ash has been investigated by replacing the native carbon content with activated charcoals and pyrocarbons from paper and PVC. Analysis of homologue totals and full isomer profiles indicate that PCDDs tend to form in preferential isomer groups, while PCDF isomers are distributed more broadly. PCDD formation is consistent with condensation of chloro phenols, together with stepwise chlorination and dechlorination. Experiments with % pentachlorophenol precursor show that fly ashes are more reactive dechlorinators than model systems, probably due to the presence of alkali elements. PCDF formation probably occurs via condensation of nonchlorinated phenol followed by chlorination of the dibenzofuran skeleton, this gives schemes of formation for both PCDDs and PCDFs that start with phenol. Demonstration of the formation of phenols in ashes and simulates is not, currently satisfactory, but aromatization of residual aliphatic oils is believed to be the most probable source. A relationship was found between the amounts of such oils present on the original carbons/ashes and the quantities of PCDD and PCDF formed.

Keywords: Combustion

Notes: highly cited

? Xing, B.S. and Pignatello, J.J. (1997), Dual-mode sorption of low-polarity compounds in glassy poly(vinyl chloride) and soil organic matter. *Environmental Science & Technology*, **31** (3), 792-799.

Full Text: [1997\Env Sci Tec31, 792.pdf](1997/Env%20Sci%20Tec31,%20792.pdf)

Abstract: The widely accepted dissolution (partition) model of sorption to soil organic matter (SOM) has been challenged by evidence that SOM has a non-uniform sorption potential. This study presents data supporting a previously suggested alternative dual-mode model of sorption in which dissolution and hole-filling mechanisms take place concurrently, as in glassy organic polymers. The holes are postulated to be nanometer-size Voids within the organic matrix that provide complexation sites. The main focus was on sorption of chlorobenzene, 1,2-dichlorobenzene, and 1,3-dichlorobenzene but some experiments were carried out also on 2,4-dichlorophenol and the herbicide metolachlor. Sorption from water to high-organic soils, humic acid particles, and poly(vinyl chloride) is nonlinear, competitive, and predictably responsive to conditions that affect hole populations such as temperature and cosolvent addition. Sorption to a peat soil and its components became progressively nonlinear and competitive in the order humic acid, native peat, humin; this order reflects The increasing “glassy”-i.e., rigid, condensed-nature of organic matter according to modern concepts of humic structure. Gas adsorption isotherms (N-2 at 77 K and CO2 at 273 K) reveal the presence of internal microvoids accessible only by diffusion through the solid phase. The degree of nonlinearity and competition correlate with the CO2-measured microvoid volumes of the sorbents. The hole-filling mechanism is more important for the kinetically slow fraction.

Keywords: Adsorption, Chemistry, CO2, Desorption, Distributed Reactivity Model, Humic Acid, Humic Substances, Isotherms, Particles, Partition, Sediments, Sorption, Systems, Transport, Vapors, Water

Cundy, A.B., Croudace, I.W., Thomson, J. and Lewis, J.T. (1997), Reliability of salt marshes as “geochemical recorders” of pollution input: A case study from contrasting estuaries in southern England. *Environmental Science & Technology*, **31** (4), 1093-1101.

Full Text: [E\Env Sci Tec31, 1093.pdf](E/Env%20Sci%20Tec31,%201093.pdf)

Abstract: Temperate, mesotidal salt marshes are usually good “geochemical recorders” of pollutant input. Dated salt marsh cores from the Hamble, Itchen (Southampton Water) and Beaulieu estuaries (southern U.K.) are assessed. Sediments show clear labeling from effluents, which varies depending on their proximity to major urban or industrial areas. For elements where input is dominantly from a single source and periods of peak discharge are known (i.e., Cu, Cs-137 and (CO)-C-60), historical records of pollutant input can be reconstructed, provided redistribution through sediment mixing or early diagenetic processes is minimal. Where the pollutant has a range of sources (i.e., Pb) or where physical mixing in-estuary produces a time-integrated signal, it can prove extremely difficult to relate concentration depth profiles to discharge histories. Using concentration and stable Pb isotope data, the observed temporal input of Pb to these marshes is shown to reflects complex, mixed marine/atmospheric input from regional (automobile emission) and local (urban/industrial) sources. While general trends in pollutant loading may still be observed, it is extremely difficult to reconstruct accurately temporal trends in Pb input and sources of Ph in these estuaries using salt marsh records due to the importance of local, poorly-defined Pb sources and in-estuary mixing processes.

Keywords: Stable Lead Isotopes, Severn Estuary, Coastal Sediments, Southwestern UK, Trace-Metals, Ratios, Accumulation, History, Pb

Meima, J.A. and Comans, R.N.J. (1997), Geochemical modeling of weathering reactions in municipal solid waste incinerator bottom ash. *Environmental Science & Technology*, **31** (5), 1269-1276.

Full Text: [E\Env Sci Tec31, 1269.pdf](E/Env%20Sci%20Tec31,%201269.pdf)

Abstract: The leaching of municipal solid waste incinerator (MSWI) bottom ash has been studied at different stages of natural weathering. Bottom ash samples, originating from a single incinerator, included grate siftings, unquenched, quenched, 6-week-old, 1.5-year-old and 12-year-old bottom ash. Leaching experiments were performed at various pH levels and liquid/solid ratios. The speciation code MINTEQA2 was used to evaluate whether the leachates are in equilibrium with minerals that are expected to form in MSWI bottom ash environments. Three major stages in weathering are identified, each stage having a characteristic pH that is controlled largely by Ca minerals and pCO2, but also by soluble Al and SO4: (1) unweathered bottom ash, with pH > 12 (grate siftings and unquenched samples), (2) quenched/noncarbonated bottom ash, with pH 10-10.5 (freshly quenched and Ei-week-old samples), and (3) carbonated bottom ash with pH 8-8.5 (1.5-and 12-year-old samples). A comparison of the leaching mechanisms identified for these stages of weathering reveals major differences for Ca, Al, Fe, Si, and SO4, for Na, K, and Cl, on the other hand, leaching mechanisms appear largely similar. The effect of weathering on the leaching of Pb, Zn, Cu, and Mo is discussed.

Keywords: Fly-Ash, Constituents, Behavior, Respect, Water

Kersten, M., Garbe-Schönberg, C.D., Thomsen, S., Anagnostou, C. and Sioulas, A. (1997), Source apportionment of Pb pollution in the coastal waters of Elefsis Bay, Greece. *Environmental Science & Technology*, **31** (5), 1295-1301.

Full Text: [E\Env Sci Tec31, 1295.pdf](E/Env%20Sci%20Tec31,%201295.pdf)

Abstract: Pb-206/Pb-207 isotope ratios were measured by ICP-MS in both seawater and sediments sampled in the severely polluted Elefsis Bay off Athens, Greece. The Pb isotope ratios found were significantly lower than those of local background or industrial sources and are influenced by the isotopic composition of gasoline lead (Pb-206/Pb-207 = 1.06). Pb pollution of the sediments is dominated by industrial activities (70-80%) leading to enrichment factors of up to 18. However, up to 70% of dissolved Ph in Elefsis Bay is derived from gasoline lead. Pb-206/Pb-207 ratios in seawater were used to trace the direction of surface flow of the contaminant plume, which was from southeast to northwest during the December 1989 cruise, but with winds blown opposite to the normal trend. The lateral Pb isotope pattern points toward the Athens sewage outfall at Keratsini Channel with surface runoff from the greater Athens area as the primary source rather than direct atmospheric impact. The isotope pattern in sequential extractions of sediments suggest that the gasoline-derived Pb fraction accumulates by precipitation with sulfide phases at rates of 2±0.5 mg m2 yr-1 during summer anoxia. Vertical Ph isotope profiles in seawater measured at all seasons indicate that this fraction is probably not remobilized upon breakdown of the pycnocline in winter and reoxidation of the sediment-water interface.

Keywords: Benthic Community Structure, Plasma-Mass-Spectrometry, Lead Isotope Ratios, Sequential Extraction, Sediments, Artifacts, Sea, Metals

Chen, J.P., Tendeyong, F. and Yiacoumi, S. (1997), Equilibrium and kinetic studies of copper ion uptake by calcium alginate. *Environmental Science & Technology*, **31** (5), 1433-1439.

Full Text: [E\Env Sci Tec31, 1433.pdf](E/Env%20Sci%20Tec31,%201433.pdf)

Abstract: Equilibrium and kinetic experiments of copper ion uptake by calcium alginate beads were carried out under different values of pH, ionic strength, initial concentration of copper ion, and amount of calcium alginate. The removal efficiency increases with increasing pH and decreasing ionic strength and initial concentration. The removal of copper occurs rapidly in the first hour, followed by a slow process that takes about 15 h. The copper ion uptake becomes faster with increasing pH and decreasing initial copper concentration and ionic strength. Mass transport of copper ions plays an important role in the kinetics of uptake. Equilibrium experiments show that surface complex formation is the major mechanism for copper ion uptake. Modeling of equilibrium and kinetics was also conducted based on a surface complexation approach. Modeling results showed that the two-pK Basic Stern model can successfully describe the effect of pH on equilibrium uptake. A diffusion-controlled model can also predict the effect of pH on the kinetics.

Keywords: Oxide-Water Interface, Metal-Ions, Gel Beads, Modeling Adsorption, Surface-Ionization, Aqueous-Solutions, Heavy-Metals, Biosorption, Complexation, Exchange

(1997), Superfund incinerator safety faulted by GAO. *Environmental Science & Technology*, **31** (6), A265.

Florig, H.K. (1997), China’s air pollution risks: Although China is struggling with major urban air quality problems, its most serious health problem is indoors. *Environmental Science & Technology*, **31** (6), 274A-279A.

Keywords: Republic-of-China, Lung-Cancer, United-States, Smoking, Patterns, Health, Women

Salt, D.E., Pickering, I.J., Prince, R.C., Gleba, D., Dushenkov, S., Smith, R.D. and Raskin, I. (1997), Metal accumulation by aquacultured seedlings of Indian mustard. *Environmental Science & Technology*, **31** (6), 1636-1644.

Full Text: [E\Env Sci Tec31, 1636.pdf](E/Env%20Sci%20Tec31,%201636.pdf)

Abstract: Indian mustard (Brassica juncea (L.) Czern) seedlings grown in aerated water (aquacultured) were able to accumulate various metals from artificially contaminated water over a range of environmentally relevant metal concentrations. Seedlings concentrated the divalent cations Pb(II), Sr(II), Cd(II), and Ni(II) 500-2000 times and concentrated the monovalent Cs(I) and hexavalent Cr(IV) 100-250 times from artificially contaminated water containing the competing ions Ca, Mg, K, SO4, and NO3. Seedlings also removed Cd from artificially contaminated water over a broad Cd concentration range. At the lowest Cd concentration studied, Cd levels were reduced to below 10 ppb (µg/L). In the absence of competing ions, Cd accumulation in seedlings increased 47-fold. This suggests that a better understanding of the biological processes governing uptake and accumulation of Cd by seedlings should allow the application of modern genetic engineering techniques to improve their selectivity and capacity for Cd removal from waters containing high levels of competing ions. As a first step in this process, we have started to define the tissue and cellular localization of Cd, its accumulation rates and possible uptake mechanisms, and the role of intracellular chelates in Cd detoxification. Intracellular Cd accumulation in seedlings was mediated by saturable transport system(s) and was inhibited competitively in shoots and noncompetitively in roots by Ca2+, Zn2+, and Mn2+. Phytochelatins, the Cd-binding peptides known to be involved in Cd resistance in mature plants, also accumulated in B. juncea seedlings exposed to Cd. Using X-ray absorption spectroscopy, we determined that over time the percentage of Cd bound to phytochelatins in vivo increased from 34% after 6 h of Cd exposure to 60% after 72 h. The remaining intracellular Cd appeared to be octahedrally coordinated by oxygen atoms possibly from organic acids. Our results suggest that the use of aquacultured seedlings of B. juncea could provide a novel approach to the treatment of various metal-contaminated waste streams such as landfill, mining and various industrial runoffs, and leachates.

Keywords: Absorption Fine-Structure, Maize Seedlings, Heavy-Metals, Cadmium, Phytochelatins, Roots, Peptides, Glutathione, Program, Plants

Weber, Jr., W.J. and Young, T.M. (1997), A distributed reactivity model for sorption by soils and sediments. 6. Mechanistic implications of desorption under supercritical fluid conditions. *Environmental Science & Technology*, **31** (6), 1686-1691.

Full Text: [E\Env Sci Tec31, 1686.pdf](E/Env%20Sci%20Tec31,%201686.pdf)

Abstract: Phenanthrene desorption isotherms for five dry soil materials were measured in supercritical carbon dioxide (SC CO2) at up to 12 different temperature (40-60 ºC) and pressure (120-310 atm) conditions for each soil. The Freundlich model adequately described all 40 isotherms obtained. At each condition, sorption capacity increased with increasing organic matter content with a positive dependence on oxygen content. Trends in desorption with SC CO2 temperature and pressure were qualitatively consistent with variations in phenanthrene solubility. A diagenetically altered shale material displayed desorption increases similar in magnitude to solubility changes, but increased pressure stimulated desorption from surface soils far less than expected from solubility considerations. Swelling of amorphous macromolecular soil organic matter (SOM) in the non-shale materials at higher SC CO2 pressures is postulated to increase the sorption capacity of the SOM phase, largely offsetting the increased capacity of the solvent phase that accompanies pressure increases. The results extend application of the distributed reactivity model (DRM) to non-aqueous solvents and dry soil systems and lend additional support to the mechanistic importance of rigid or glassy SOM domains in the sorption of non-ionic organic chemicals.

Young, T.M. and Weber, Jr., W.J. (1997), A distributed reactivity model for sorption by soils and sediments. 7. Enthalpy and polarity effects on desorption under supercritical fluid conditions. *Environmental Science & Technology*, **31** (6), 1692-1696.

Full Text: [E\Env Sci Tec31, 1692.pdf](E/Env%20Sci%20Tec31,%201692.pdf)

Abstract: Mechanisms of phenanthrene desorption from five subsurface materials in supercritical carbon dioxide (SC CO2) were investigated by measuring isotherms in the presence of fixed quantities of a polar cosolvent (methanol) and by calculating desorption enthalpies from the temperature dependence of the isotherms. The addition of 7.4 mol % methanol to the SC CO2 phase resulted in 2-11-fold reductions in Freundlich capacity factors at 120 atm and 50 ºC. The capacity reduction greatly exceeded that expected from the 21% increase in phenanthrene solubility accompanying cosolvent addition. Isotherms became more linear at 120 atm and 50 ºC upon methanol addition for all sorbents except a shale sample. Solubility and organic carbon-normalized phenanthrene sorption capacities declined with increasing solvent polarity, in the order dry SC CO2 > methanol-amended SC CO2 > aqueous solution, and declined with sorbent organic carbon content. Sorption enthalpies from an ideal gas reference state ranged from -106 to -70 kJ/mol, similar to phenanthrene’s heat of condensation of -70.7 kJ/mol. The results indicate that the primary mechanism for polar cosolvent desorption enhancement is competitive displacement of phenanthrene from polar sites within soil organic matter or on mineral surfaces.

Keywords: Adsorption, Carbon-Dioxide, Clay-Minerals, Desorption, Displacement, Extraction, Ionic Organic-Compounds, Matter, Organic Matter, Phenanthrene, Relative-Humidity, Sorption, Temperature, Vapors, Water

LeBoeuf, E.J. and Weber, Jr., W.J. (1997), A distributed reactivity model for sorption by soils and sediments. 8. Sorbent organic domains: Discovery of a humic acid glass transition and an argument for a polymer-based model. *Environmental Science & Technology*, **31** (6), 1697-1702.

Full Text: [E\Env Sci Tec31, 1697.pdf](E/Env%20Sci%20Tec31,%201697.pdf)

Abstract: Analysis of a humic acid by differential scanning calorimetry has revealed the existence of a glass transition point. Glass transition temperatures, *T*g, of water-wet and desiccator-dry specimens were found to range from 43 ºC for water-wet humic acid to 62 ºC for dry samples. Phenanthrene sorption isotherms for these and other natural and synthetic organic matrices having known glass transition tempera tures were determined to exhibit linearity and nonlinearity corresponding respectively to the rubbery (expanded) and glassy (condensed) states of the sorbent. Invoking a limiting case of the distributed reactivity model based on polymer sorption theory, we explain the observed sorption behavior as comprised in each case by a linear phase-partitioning component and a Langmuir-like nonlinear adsorption component. We conclude that polymer sorption theory provides a useful context in which to assess sorption phenomena associated with soil and sediment organic matter, providing more accurate projections of contaminant behavior in environmental systems and better informed specifications of appropriate remediation measures.

Keywords: Adsorption, Desorption, Humic Acid, Organic Matter, Powders, Sorption, Systems, Temperature, Transport

Huang, W.L., Young, T.M., Schlautman, M.A., Yu, H. and Weber, Jr., W.J. (1997), A distributed reactivity model for sorption by soils and sediments. 9. General isotherm nonlinearity and applicability of the Dual Reactive Domain Model. *Environmental Science & Technology*, **31** (6), 1703-1710.

Full Text: [E\Env Sci Tec31, 1703.pdf](E/Env%20Sci%20Tec31,%201703.pdf)

Abstract: Sorption isotherms for a hydrophobic solute probe, phenanthrene, were measured experimentally for 27 different soils and sediments. The linear and Freundlich isotherm models and the Dual Reactive Domain Model (DRDM) were used to fit the resulting data. The results reveal for *all* soils and sediments studied that (i) the Freundlich model and the DRDM fit the data well, whereas a linear model fails to do so, (II) values of the organic carbon-normalized distribution coefficient, *K*OC, calculated from individual isotherm points for a specific sorbent-solute system vary significantly with the aqueous-phase solute concentration, *C*e, and (iii) all commonly used correlations of *K*OC with octanol-water partitioning coefficients and solute solubility limits significantly underestimate *K*OC for *C*e values smaller than approximately one-tenth of aqueous-phase solute solubility, *C*S. The sorption behaviors of all of the soils and sediments studied are thus inconsistent with the simple concept of linear phase partitioning. The general applicability of the DRDM, a polymer-based limiting case form of the Distributed Reactivity Model, for all systems studied supports mechanistic arguments based on polymer sorption theory.

Ballerstedt, H., Kraus, A. and Lechner, U. (1997), Reductive dechlorination of 1,2,3,4-tetrachlorodibenzo-p-dioxin and its products by anaerobic mixed cultures from Saale river sediment. *Environmental Science & Technology*, **31** (6), 1749-1753.

Full Text: [E\Env Sci Tec31, 1749.pdf](E/Env%20Sci%20Tec31,%201749.pdf)

Abstract: The capability of anaerobic bacterial consortia from different environmental sources including soils, sewage sludges, and sediment of the river Saale (Germany) to dehalogenate chlorinated dioxins was compared using 1,2,3,4-tetrachloradibenzo-p-dioxin (1,2,3,4-TCDD) as the model compound. The inocula were amended with mineral medium and organic acids and spiked with a high concentration (50 µM) of 1,2,3,4-TCDD to stimulate microbial dehalogenating activity. Reductive dechlorination was observed to 1,3-Dichlorodibenzo-p-dioxin (1,3-DCDD) as the main product and to minor amounts of the 1,2,4- and 1,2,3-trichlorodibenzo-p-dioxins (TrCDD) using incubations with Saale River sediment. No reaction was observed in the controls and in incubations with soils or sewage sludges. The dechlorination of 1,2,4- and 1,2,3-TrCDD was analyzed in separate subcultures. Reductive dechlorination of 1,2,4-TrCDD was a relative fast process (about 6 µM converted within 58 days) and yielded only one product (1,3-DCDD). 1,2,3-TrCDD was slowly dechlorinated to equal amounts of 1,3- and 2,3-DCDD. These observations suggest that the main dechlorination route of 1,2,3,4-TCDD to 1,3-DCDD proceeds primarily via the removal of a lateral chlorine atom with 1,2,4-TrCDD as the intermediate.

Keywords: Dibenzo-p-Dioxins, Polychlorinated Biphenyl Dechlorination, Microorganisms, Enrichment, Biodegradation, Dehalogenation, PCDD

Brubaker, Jr., W.W. and Hites, R.A. (1997), Polychlorinated dibenzo-p-dioxins and dibenzofurans: Gas phase hydroxyl radical reactions and related atmospheric removal. *Environmental Science & Technology*, **31** (6), 1805-1810.

Full Text: [E\Env Sci Tec31, 1805.pdf](E/Env%20Sci%20Tec31,%201805.pdf)

Abstract: Gas-phase reactions with the hydroxyl radical (OH) are expected to be an important removal pathway of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/F) in the atmosphere. Our laboratory recently developed a system to measure the rate constants of the gas-phase reactions of OH with semivolatile organic compounds using on-line mass spectrometry. We have now incorporated electron capture mass spectrometry (EC-MS) into this system to increase its sensitivity to PCDD/F, which tend to have low vapor pressures. OH reaction rate constants were determined in helium for 1,2,3,4-tetrachlorodibenzo-p-dioxin at 373-432 K using a heated quartz reaction chamber. The photolysis of O3 in the presence of H2O and the photolysis of H2O2 (both at lambda = 254 nm) served as OH sources. An extrapolation using the Arrhenius equation gives a 1,2,3,4-tetrachlorodibenzo-p-dioxin-OH reaction rate constant of 8.5×10-13 cm3 s-1 at 298 K, which is in excellent agreement with the value predicted by a structure-activity method. The predicted OH reaction rate constants for tetra- through octachlorodibenzo-p-dioxin and dibenzofuran isomers were used in a simple model of the atmospheric removal of PCDD/ F. The results of our model indicate that atmospheric removal is a combination of gas-phase removal processes of lower chlorinated dioxins and furans and particle-phase removal processes of higher chlorinated ones.

Keywords: Municipal Solid-Wastes, Organic-Compounds, PCDF Emissions, Fly-Ash, Combustion, Chemistry

Gullett, B.K., Natschke, D.F. and Bruce, K.R. (1997), Thermal treatment of 1,2,3,4-tetrachlorodibenzo-p-dioxin by reaction with Ca-based sorbents at 23-300°C. *Environmental Science & Technology*, **31** (7), 1855-1862.

Full Text: [E\Env Sci Tec31, 1855.pdf](E/Env%20Sci%20Tec31,%201855.pdf)

Abstract: The fate of combustion-generated polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) captured in sorbent-based, air pollution control devices remains uncertain. This process was simulated by passing vapor-phase 1,2,3,4-tetrachlorinated dibenzo-p-dioxin (TCDD) to a fixed-bed reactor laden with, typically, 1 g of calcium (Ca)-based sorbent The sorbent bed, reactor rinsate, evaporation chamber, and gas impingers were analyzed separately to balance and account for the TCDD input. Tests at 160-300°C demonstrated 50 to 100% conversion of TCDD to higher molecular weight, chlorinated products with both aromatic and aliphatic components. The unlikeliness of conventional semivolatile GC/MS analyses to detect these higher molecular weight products may offer an alternative explanation for research studies citing destruction or volatilization of chlorinated organics in the presence of Ca-based sorbents. The applicability of this reaction to other halogenated organics, such as polychlorinated biphenyls, may provide a method for contaminated soil treatment. More extensive experimental and analytical work is necessary to fully understand the reaction mechansim, the full range and stability of potential reaction products, and the ecological and human health implications. Alteration of the structural symmetry and size of the TCDD molecule (and related halogenated organics) will likely cause significant reductions in toxicity.

Keywords: Ultrafine Nanoscale Particles, Dibenzo-p-Dioxin, Destructive Adsorption, Calcium-Oxide, Fly-Ash, Municipal, Incinerators, Combustion, Emissions, Magnesium

Davis, A., De Curnou, P. and Eary, L.E. (1997), Discriminating between sources of arsenic in the sediments of a tidal waterway, Tacoma, Washington. *Environmental Science & Technology*, **31** (7), 1985-1991.

Full Text: [E\Env Sci Tec31, 1985.pdf](E/Env%20Sci%20Tec31,%201985.pdf)

Abstract: Various industries located along the Hylebos Waterway in Tacoma, WA, and runoff from slag used for road ballast are potential sources of elevated arsenic concentrations found in the waterway sediments. To discriminate between specific sources of As to the waterway, the history of arsenic deposition was reconstructed using Cs-137 sediment age-dating combined with characterization of arsenic solid phases. In a sediment core collected near a former powdered metals facility, As occurred primarily in metal sulfides, reaching peak concentrations in the mid-1950s, consistent with the operational history of that facility. In a second core collected near a pesticide plant that historically discharged soluble arsenic, total arsenic was present predominantly as surface-bound species in sediment predating the mid-1980s, decreasing in recent sediments coincident with initiation of remedial measures in 1981. Ferroalloy and smelter slags were recent and optically distinguishable. The combination of optical microscopy and electron and laser-ion microprobe techniques in conjunction with historical information and radioisotopic analysis provides a powerful tool to differentiate between metal sources to sediments.

Keywords: Marine-Sediments, Patterns

Manning, B.A. and Goldberg, S. (1997), Adsorption and stability of arsenic(III) at the clay mineral-water interface. *Environmental Science & Technology*, **31** (7), 2005-2011.

Full Text: [E\Env Sci Tec31, 2005.pdf](E/Env%20Sci%20Tec31,%202005.pdf)

Abstract: Adsorption and oxidation reactions of arsenite (As(III)) at the mineral-water interface are two important factors affecting the fate and transport of arsenic in the environment Numerous studies have concluded that As(II) is more soluble and mobile than arsenate (As(V)) in soils, though very little experimental work has demonstrated the differences in reactivity and stability of As(III) and As(V) at the mineral-water interface. In this investigation, As(III) adsorption on kaolinite, illite, montmorillonite, and amorphous aluminum hydroxide (am-Al(OH)3) was studied as a function of pH and ionic strength and was compared with As(V) adsorption. High-performance liquid chromatography-hydride generation atomic absorption spectrophotometry (HPLC-HGAAS) was employed for direct determination of As(III) and As(V). In addition, surface complexation modeling was used to describe As(III) and As(V) adsorption on the four minerals. It was revealed that alkaline solutions (pH > 9) without mineral solids caused homogeneous oxidation of As(III) to As(V). In addition, recovery of adsorbed As from As(III)-treated clay mineral solids showed that oxidation of As(III) to As(V) was enhanced by heterogeneous oxidation on kaolinite and illite surfaces.

Keywords: Oxide, Chemistry, Oxidation, Arsenate, Arsenite, Groundwater, Sediments, Selenium, Surface, Boron

Coleman, P.J., Lee, R.G.M., Alcock, R.E. and Jones, K.C. (1997), Observations on PAH, PCB, and PCDD/F trends in UK urban air, 1991-1995. *Environmental Science & Technology*, **31** (7), 2120-2124.

Full Text: [E\Env Sci Tec31, 2120.pdf](E/Env%20Sci%20Tec31,%202120.pdf)

Abstract: Ambient air concentrations at London and Manchester are reported for PCBs, PAHs, and PCDD/Fs from 1991 to 1995. This data set suggests that urban PAH concentrations are trending downward in the U.K. Sigma PCB concentrations (Sigma = congeners 28, 52, 101, 118, 138, 153, and 180) were usually similar to 0.2-2 ng m-3 over the study period, with concentrations of the seven PCB congeners (Sigma PCB) in London generally 2-3 times higher than in Manchester. PCB concentrations have remained quite stable year-on-year over the study period. PCDD/F trends at the two sites were similar, with a decline through 1991-1994, followed by an upturn in 1995. Summer: winter seasonality of PCDD/Fs at both sites has been highly erratic year-on-year and compound-by-compound, far more so than for PAHs and PCBs. This is perhaps best interpreted as a sign that various sources (presumably combustion-derived) have contributed different mixtures of PCDD/Fs of different source strengths at different times to the air at these urban sites. Possible causes are discussed.

Keywords: Polycyclic Aromatic-Hydrocarbons, Dibenzo-Para-Dioxins, Polychlorinated-Biphenyls, Atmospheric Concentrations, United-Kingdom, Fluxes, Bloomington, Indiana, Lake

Kendall, D.S., Mushak, P. and Drexler, J.W. (1997), Incinerator or recycler? *Environmental Science & Technology*, **31** (9), A393.

Davis, A. and Ruby, M.V. (1997), Incinerator or recycler? Reply. *Environmental Science & Technology*, **31** (9), A393-A394.

Schiewer, S. and Volesky, B. (1997), Ionic strength and electrostatic effects in biosorption of divalent metal ions and protons. *Environmental Science & Technology*, **31** (9), 2478-2485.

Full Text: [E\Env Sci Tec31, 2478.pdf](E/Env%20Sci%20Tec31,%202478.pdf)

Abstract: This study is concerned with passive biosorption of metal ions by biomass of the brown alga Sargassum, a process that may eventually be used for the treatment of industrial wastewaters, This work provides a mathematical model for predicting the equilibrium of proton and metal ion binding as a function of metal ion concentration, pH, and ionic strength. Since the presence of sodium significantly influenced Cd binding, it is recommended to use models that incorporate ionic strength effects. Although swelling of the biomass particle was observed, a simple Donnan model that assumed a rigid particle already yielded good prediction of the experimental data. A combined Donnan-Biosorption-Isotherm equation was derived that allowed for direct calculation of cation binding without iterations. Only one parameter, the binding constant, had to be determined each for Cd and Ca. The intrinsic binding constant was several orders of magnitude lower than the apparent one. Using the parameters (amount of binding sites, proton binding constant, and specific particle volume) obtained from pH titrations in an earlier study, it was possible to predict the effect of pH, ionic strength, and Ca concentration on Cd binding.

Keywords: Poly-Electrolyte Properties, Fulvic-Acid, Physicochemical Description, Complexation Equilibria, Humic Substances, Binding, Heterogeneity, Exchange, Alginate, Biomass

Notes: highly cited

Huang, W.L. and Weber, Jr., W.J. (1997), A distributed reactivity model for sorption by soils and sediments. 10. Relationships between desorption, hysteresis, and the chemical characteristics of organic domains. *Environmental Science & Technology*, **31** (9), 2562-2569.

Full Text: [E\Env Sci Tec31, 2562.pdf](E/Env%20Sci%20Tec31,%202562.pdf)

Abstract: Phenanthrene sorption and desorption equilibria were measured for 10 natural sorbents having significantly different geological ages and organic matter compositions. Three geologically young peats, one humic acid, three geologically old shales, and samples of kerogen isolated from each of the shales were examined. Elemental analyses and solid-state 13C-NMR spectra reveal that the oxygen/carbon (O/C) atomic ratios of the soil organic matter (SOM) as sociated with the samples decrease with increased age and, thus, apparently with diagenetic alteration. The sorption affinities of these materials for phenanthrene as well as their respective isotherm nonlinearities and hysteretic behaviors were found to correlate inversely with the O/C atomic ratio, samples containing more physically condensed and chemically reduced SOM matrices exhibited greater solute affinity, more nonlinear sorption equilibria, and more pronounced hysteresis. Observed relationships between the chemical and structural characteristics of associated organic matter and the sorption and desorption behaviors of the samples are captured effectively by the concepts underlying the Dual Reactive Domain Model advanced earlier in this series. This study thus extends that model to include the desorption process, supporting its general ap plicability for characterizing the overall behavior of soils and sediments with respect to solute uptake and release.

Keywords: Adsorption-Desorption, Atrazine, Contaminated Soils, Desorption, Field, Humic Acid, Kinetics, Matter, Organic Matter, Partition, Phenanthrene, Polynuclear Aromatic-Hydrocarbons, Reversible Sorption, Sorption, Water

Bürgisser, C.S. and Stone, A.T. (1997), Determination of EDTA, NTA, and other amino carboxylic acids and their Co(II) and Co(III) complexes by capillary electrophoresis. *Environmental Science & Technology*, **31** (9), 2656-2664.

Full Text: [E\Env Sci Tec31, 2656.pdf](E/Env%20Sci%20Tec31,%202656.pdf)

Abstract: EDTA and NTA were widely used in the processing of nuclear materials and in the production of nuclear energy. Their in-plant chemical transformations and post-disposal chemical and biological transformations generated many additional amino carboxylic acid compounds. Toxic and radioactive metals are frequent co-contaminants of these chelating agents. Some of the resulting metal ion-chelating agent complexes, most notably (60)Co(III)EDTA, resist decomposition and adsorb poorly onto subsurface minerals, thereby facilitating migration. This study sought to separate and detect free amino carboxylic acids and their Co(II) and Co(III) complexes in a single run without prior pretreatment using capillary electrophoresis (CE). The electrolyte filling the CE capillary contained 25 mM phosphate buffer (pH 7). Equilibrium calculations performed for this electrolyte identified predominant cobalt species and helped explain the CE findings. Co(III) complexes are thermodynamically (and kinetically) more stable than corresponding Co(II) complexes and are readily separated and detected. Co(III) complexes of EDTA, NTA, and IDA were synthesized and analyzed. Two different diastereomers of Co(III)IDA(2) were found and could be separated. Co(II)-amino carboxylate complexes range from ones that are not thermodynamically stable in the capillary and therefore not detectable to those that are highly stable in the capillary and yield good linearity.

Keywords: Zone Electrophoresis, Conductivity Detection, Nitrilotriacetic Acid, Quantitative-Analysis, Aqueous-Solution, Organic-Acids, Metal-Ions, Water, Adsorption, Ethylenediaminetetraacetate

? Jang, M., Kamens, R.M., Leach, K.B. and Strommen, M.R. (1997), A thermodynamic approach using group contribution methods to model the partitioning of semivolatile organic compounds on atmospheric particulate matter. *Environmental Science & Technology*, **31** (10), 2805-2811.

Full Text: [1997\Env Sci Tec31, 2805.pdf](1997/Env%20Sci%20Tec31,%202805.pdf)

Abstract: Atmospheric particulate matter is a complex mixture consisting of organic and inorganic chemicals. Their sources include various combustion processes, aerosolized dusts and soils, and chemical reactions which produce secondary aerosols. The partitioning of semivolatile toxic organic compounds (SOCs) between particulate matter and the gas phase is strongly influenced by temperature. water concentration, chemical composition of the particulate matter, and the organic fraction of the particulate matter. Many investigations have recently suggested that a considerable portion of the gas-particle (G/P) partitioning in the ambient atmosphere takes place between the liquid phase of organic aerosols and the surrounding gas phase. It has been shown that the equilibrium G/P partitioning constant, K-p, of an SOC partitioning to a given particle’s liquid medium is inversely related to both the activity coefficient (i) gamma(om) and its saturated subcooled liquid vapor pressure, p(L)(o). Hence, in principal, the K-p of any SOC can be estimated from its vapor pressure and activity coefficient in a given liquid mixture. To calculate activity coefficients of SOCs in the liquid phase of different types of particles, semiempirical thermodynamic models based on additive chemical functional group methods were used, Outdoor chambers were used to generate G/P partitioning data sets for a range of SOCs in the presence of particles from wood and diesel combustion and secondary aerosols from the reaction of alpha-pinene with ozone. The partitioning SOCs ranged from nonpolar alkanes to polar organic acids. Plots of log ((i) gamma(om)K(p)) vs log p(L)(o) showed a vast improvement over typical log K-p vs log p(L)(o) plots. These results suggest that equilibrium partitioning of many different types of SOCs can be estimated in almost any organic layer of an atmospheric aerosol.

Keywords: Polycyclic Aromatic-Hydrocarbons, Unifac Group Contribution, Vapor-Liquid-Equilibria, Henrys Law Constants, Activity-Coefficients, Gas, Aerosol, Benz<A>Anthracene, Photodegradation, Parameters

Brower, J.B., Ryan, R.L. and Pazirandeh, M. (1997), Comparison of ion-exchange resins and biosorbents for the removal of heavy metals from plating factory wastewater. *Environmental Science & Technology*, **31** (10), 2910-2914.

Full Text: [E\Env Sci Tec31, 2910.pdf](E/Env%20Sci%20Tec31,%202910.pdf)

Abstract: The NCP (Neurospora crassa gene expressed in the periplasmic space) is a recombinant *Escherichia* coli expressing the Neurospora crassa metallothionein gene within the periplasmic space. The, NCP has been shown to remove heavy metals from solutions containing low concentration of heavy metals. In this study, the ability of NCP to remove heavy metals from wastewater was compared to the commercial sorbents Duolite GT-73, IRC-718, and BIG-FIX. Three process wastewater streams, acid/alkali, chromate, and cyanide, were tested at their original pH and near neutral pH. In addition to other contaminants, the wastewaters contained metals including Cd, Cu, Ni, and Ag. NCP was most efficient in removing the heavy metals from wastewaters at near neutral pH. Chromium removal per gram of IRC-718 at pH 2.05 was an order of magnitude higher than any other sorbent in either pH-unadjusted or pH-adjusted samples. Duolite GT-73, IRC-718, and BIG-FIX had similar efficiency in removing heavy metals from the pH-adjusted wastewater. When the sorbents were tested for removal of part per billion levels of Cd-109, NCP demonstrated the highest percent removal. These results suggest potential treatment strategies for metal-contaminated wastewaters involving pH adjustment and primary treatment with a commercial sorbent followed by polishing with NCP.

Keywords: Yeast Metallothionein, Biotechnology, Biosorption

Jones, K.C. and Duarte-Davidson, R. (1997), Transfers of airborne PCDD/Fs to bulk deposition collectors and herbage. *Environmental Science & Technology*, **31** (10), 2937-2943.

Full Text: [E\Env Sci Tec31, 2937.pdf](E/Env%20Sci%20Tec31,%202937.pdf)

Abstract: PCDD/F air concentrations, deposition fluxes, and grass concentrations/offtakes (pg m-2 day-1) were measured concurrently in Bolsover, Derbyshire, England over 1 year during 1992-1993. The data are used here to discuss spatial and temporal differences in atmospheric PCDD/F concentrations and how the airborne PCDD/Fs transferred to the bulk deposition collectors and grass. Three sample sites are discussed, namely, a regional background site (RES), an urban site (US), and a site close to an industrial complex (IS) that has been a suspected source of selected PCDD/F homologs. Generally, the mixture of PCDD/F 2,3,7,8-substituted congeners and homologs was the same in the air, in the bulk deposition, and in the grass over a given sampling period and site. This suggests that PCDD/Fs of different levels of chlorination were transferring with similar efficiencies from the air to the collectors and grass, despite different gas-particle partitioning in the air. Deposition or transfer velocities for individual congeners/homologs to the bulk collectors throughout the whole study ranged between 0.034 and 0.82 cm s-1 at the sites, averaging 0.27 cm s-1 for PCDD/Fs at the RES. An experiment conducted to assess potential volatilization of soilborne PCDD/Fs from contaminated areas near the IS showed that all the compounds had a strong affinity for the soil and that volatilization is not likely to significantly contaminate herbage growing in the contaminated soil or the overlying atmosphere near this site. Herbage PCDD/Fs were therefore derived almost exclusively from the atmosphere in this study. The similarities in the PCDD/F mixture in air and grass suggest that the different PCDD/Fs are scavenged by the grass sward from the atmosphere with similar efficiencies, the implications of this are discussed.

Keywords: Dibenzo-p-Dioxins, Welsh Ray Grass, Model, Validation, Chemicals, Soil, Air

Procopio, J.R., Viana, M.D.M. and Hernandez, L.H. (1997), Microcolumn ion-exchange method for kinetic speciation of copper and lead in natural waters. *Environmental Science & Technology*, **31** (11), 3081-3085.

Full Text: [E\Env Sci Tec31, 3081.pdf](E/Env%20Sci%20Tec31,%203081.pdf)

Abstract: A scheme for metal speciation based on an ion-exchange column procedure has been developed. The dissociation kinetics of metal complexes were studied using a Amberlite XAD-8 microcolumn technique, covering a time scale of measurement between 0.02 and 3 s. Application of this procedure to copper and lead complexes permits their characterization in four lability categories: labile, quasi-labile, slowly labile, and inert. This procedure has been applied to species of copper and lead in natural waters (e.g., Jarama River).

Keywords: Cadmium

Isaac, R.A., Gil, L., Cooperman, A.N., Hulme, K., Eddy, B., Ruiz, M., Jacobson, K., Larson, C. and Pancorbo, O.C. (1997), Corrosion in drinking water distribution systems: A major contributor of copper and lead to wastewaters and effluents. *Environmental Science & Technology*, **31** (11), 3198-3203.

Full Text: [E\Env Sci Tec31, 3198.pdf](E/Env%20Sci%20Tec31,%203198.pdf)

Abstract: Corrosion, even in water supply systems with treatment to reduce it, can be a major contributor of copper and lead to both treated municipal (publicly owned treatment works, POTW) wastewater effluents and biosolids. Lead and copper concentrations were measured at several points in the water/wastewater systems of four Massachusetts municipalities. Domestic wastewater was found to contain concentrations of lead and copper significantly higher (p < 0.05) than those in source waters. For each facility, the median concentration of Cu in domestic wastewater was a substantial fraction of the median concentration found in the influent to the POTWs with ratios of 0.36, 0.41, 0.65, and 1.25 for Gardner, New Bedford, Fall River, and Clinton, respectively. The values for lead, in the same order, were 0.28, 0.19, 0.17, and 0.69 (this last ratio based on mean values). Data from the study indicate that minimizing influent concentrations of Cu and Pb to POTWs is an important control factor since the finding of constant removal efficiency for these two constituents means that the higher their concentrations in the influent, the higher they will be in the effluent These observations strongly support the concern that corrosive drinking water contributes substantially to exceeding, at a minimum, water quality criteria for copper, where dilution of wastewater effluents is low. In turn, this argues for corrosion reduction efforts in water supply systems and the means by which such controls are effected to consider impacts on wastewater as well, which generally is not now done.

Keywords: Metals

Mahuli, S., Agnihotri, R., Chauk, S., Ghosh-Dastidar, A. and Fan, L.S. (1997), Mechanism of arsenic sorption by hydrated lime. *Environmental Science & Technology*, **31** (11), 3226-3231.

Full Text: [E\Env Sci Tec31, 3226.pdf](E/Env%20Sci%20Tec31,%203226.pdf)

Abstract: Arsenic, along with mercury and selenium, represents one of the trace metallic emissions from fossil fuel-fired power plants that exhibit a tendency to remain in the gas phase. In this study, the effectiveness of some commonly used mineral sorbents is tested for the removal of arsenic from flue gas. Investigations are conducted with hydrated lime sorbent to identify the mechanism of As/Ca interaction and the chemical state and characteristics of captured species. Arsenic oxide (As2O3) is used as the representative arsenic species, and investigations are conducted in a differential fixed bed reactor at medium (400-600°C) and high (1000-800°C) temperature conditions. Comparison of Ca(OH)2 with three other mineral sorbents (kaolinite, alumina, and silica) reveals that calcium hydroxide is the most effective in capturing arsenic. The capture mechanism of Ca(OH)2 does not involve a simple physical adsorption but proceeds by means of an irreversible chemical reaction leading to a solid product. X-ray diffraction and ion chromatography analyses of the post-sorption sample confirm that calcium arsenate is the dominant reaction product. Sorption of arsenic by fly ash is found to be reversible and physical in nature.

Keywords: Ca-Based Sorbents, Trace-Elements, Electrostatic Precipitators, Particle-Size, Removal, Emissions, Gases, HCl

Laine, M.M., Ahtiainen, J., Wagman, N., Oberg, L.G. and Jorgensen, K.S. (1997), Fate and toxicity of chlorophenols, polychlorinated dibenzo-p-dioxins, and dibenzofurans during composting of contaminated sawmill soil. *Environmental Science & Technology*, **31** (11), 3244-3250.

Full Text: [E\Env Sci Tec31, 3244.pdf](E/Env%20Sci%20Tec31,%203244.pdf)

Abstract: We studied the fate of chlorophenols during the composting of sawmill soil and impregnated wood to see whether chlorophenols, in addition to mineralization, would form any harmful metabolites. The toxicity assessed by luminescent bacteria tests decreased during the composting, and it followed the chlorophenol concentrations in the compost piles. The threshold value for chlorophenol toxicity appeared to be 200 mg of total chlorophenols/kg dry weight. Polymerization of chlorophenols was studied by determining the molecular weight distribution of organic halogen compounds during the bioremediation. Organic chlorine compounds appeared in high molecular weight sizes, indicating that binding to soil organic matter had taken place during the long exposure time to the wood preservative Ky-5 in the contaminated soil. No major polymerization occurred during the composting, but the polymerized fraction was not either degraded or remobilized. Large amounts of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs) originating from the wood preservative were found in the compost piles, but their concentrations did not significantly change during the bioremediation process. The congener composition of PCDD/Fs resembled the one in original wood preservative. Since PCDD/Fs were released from the wood chips of the former Ky-5 dipping basin and not degraded during the bioremediation, it is not recommended to treat PCDD/F-contaminated wood chips in biopiles.

Keywords: Polychlorodibenzofuran Concentrations, Chlorinated Phenols, Humic-Acid, Dechlorination, Degradation, Water, Environments, Metabolism, Sediments, Pollution

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Notes: highly cited

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Full Text: [E\Env Sci Tec31, 3341.pdf](E/Env%20Sci%20Tec31,%203341.pdf)

Abstract: The chemical interactions of hydrophobic organic contaminants (HOCs) with soils and sediments (geosorbents) may result in strong binding and slow subsequent release rates that significantly affect remediation rates and endpoints. The underlying physical and chemical phenomena potentially responsible for this apparent sequestration of HOCs by geosorbents are not well understood. This challenges our concepts for assessing exposure and toxicity and for setting environmental quality criteria. Currently there are no direct observational data revealing the molecular-scale locations in which nonpolar organic compounds accumulate when associated with natural soils or sediments. Hence macroscopic observations are used to make inferences about sorption mechanisms and the chemical factors affecting the sequestration of HOCs by geosorbents. Recent observations suggest that HOC interactions with geosorbents comprise different inorganic and organic surfaces and matrices, and distinctions may be drawn along these lines, particularly with regard to the roles of inorganic micropores, natural sorbent organic matter components, combustion residue particulate carbon, and spilled organic liquids. Certain manipulations of sorbates or sorbent media may help reveal sorption mechanisms, but mixed sorption phenomena complicate the interpretation of macroscopic data regarding diffusion of HOCs into and out of different matrices and the hysteretic sorption and aging effects commonly observed for geosorbents. Analytical characterizations at the microscale, and mechanistic models derived therefrom, are needed to advance scientific knowledge of HOC sequestration, release, and environmental risk.

Keywords: Distributed Reactivity Model, Humic Substances, Nonequilibrium Sorption, Aromatic-Hydrocarbons, Interfacial Films, Aquifer Material, Soils, Sediments, Water, Chemicals

Colombo, J.C., Brochu, C., Bilos, C., Landoni, P. and Moore, S. (1997), Long term accumulation of individual PCBs, dioxins, furans, and trace metals in Asiatic clams from the Rio de la Plata Estuary, Argentina. *Environmental Science & Technology*, **31** (12), 3551-3557.

Full Text: [E\Env Sci Tec31, 3551.pdf](E/Env%20Sci%20Tec31,%203551.pdf)

Abstract: The long-term accumulation of individual polychlorinated biphenyls (PCB), dioxins (CDD), furans (CDF), and selected trace metals was studied in Asiatic clams of increasing size covering a 0.5-4-year growth period. PCB bioaccumulation was congener-specific and related to compound hydrophobicity and stereochemistry as indicated the contrasted slopes obtained for the concentration vs size regressions. Tri and tetraCB with log K-DW < 6 showed nonsignificant slopes, indicating steady-state conditions or negative values (i.e., PCB 31 and 49) reflecting selective degradation. Penta and hexa CB with log K-DW, 6-7 (total surface area = 240-270 Angstrom(2)) were preferentially accumulated, and the slopes increased with log K-ow. Except for congener 180, which continued this linear trend, hepta and octaCB showed a reduced long-term accumulation due to unfavorable stereochemistry. The selective enrichment in congeners 153, 138, 118, and 180 explained 74% of the total PCB increase observed from 10 to 35 mm clams (446-871 ng/g dw). CDD and CDF also increased with size but with much steeper gradients (136-790 and 70-400 pg/g, respectively), indicating a more rapid long-term kinetics. PCBs accounted for 83-88% of the total toxic equivalents (TEQ) calculated for the clams, pentaCBs 126 and 118 represented similar to 60 and 10% TEQ, respectively. The preferential bioaccumulation of planar PCBs 77-126, mono-ortho-substituted 118 and tetra-hexa CDD/CDF accounted for 95% of the TEQ increase observed from 10 to 35 mm clams (7.1-13.1 pg/g wet weight). Among trace metals, Cu showed a consistent increasing trend with clam size (22-41 µg/g dw), similar to PCBs, suggesting continuous passive bioaccumulation. Bioregulation appeared to be effective for Zn whose concentrations increased from 10 to 22 mm clams (150-190 µg/g dw) and returned to initial values in larger animals. Ni levels were very homogeneous (3.5±0.4 µg/g dw) and showed no clear pattern with clam size.

Keywords: Water Partition-Coefficients, Dibenzo-p-Dioxins, Polychlorinated-Biphenyls, Bioconcentration Factors, Rainbow-Trout, Organisms, Sediments, Environments, Corbicula, Monitor

Morillo, E., Undabeytia, T. and Maqueda, C. (1997), Adsorption of glyphosate on the clay mineral montmorillonite: Effect of Cu(II) in solution and adsorbed on the mineral. *Environmental Science & Technology*, **31** (12), 3588-3592.

Full Text: [E\Env Sci Tec31, 3588.pdf](E/Env%20Sci%20Tec31,%203588.pdf)

Abstract: Adsorption-description of the herbicide glyphosate (GPS) onto the clay mineral montmorillonite has been studied in presence of copper, in order to clarify the effects that this strongly complexing metal could have on the availability and mobility of GPS in soil environment. In contrast with previous findings, GPS adsorption on montmorillonite decreases in the presence of Cu, in solution or adsorbed on the mineral, due to the formation of Cu-GPS complexes that have a lower tendency to be adsorbed on montmorillonite than the free GPS. GPS adsorption is higher at pH 4.2 than at pH 6.8, both in the presence and in the absence of Cu, but the decrease in GPS adsorption in the presence of Cu is lower at pH 4.2 than at pH 6.8, since at this latter pH the concentration of Cu-GPS complexes in relation to free GPS in solution is high. It is commonly believed that GPS remains almost permanently adsorbed onto soils and has very limited mobility, but GPS desorption experiments show that the amount of GPS desorbed from montmorillonite is not negligible and increases int he presence of Cu. These experiments lead to the conclusion that, in relation to GPS release from soil, it is necessary to take into account not only the type of soil to which it is applied (e.g., whether it has high clay minerals content) but also whether there is any element in the soil solution or adsorbed on the soil capable of forming strong complexes with GPS.

Keywords: Cationic Pesticide, Ligands, Soils

? Behrens, E.A., Sylvester, P. and Clearfield, A. (1998), Assessment of a sodium nonatitanate and pharmacosiderite-type ion exchangers for strontium and cesium removal from DOE waste simulants. *Environmental Science & Technology*, **32** (1), 101-107.

Full Text: [1998\Env Sci Tec32, 101.pdf](1998/Env%20Sci%20Tec32,%20101.pdf)

Abstract: Several inorganic ion exchangers were tested for Sr-89 and Cs-137 removal from simulated DOE aqueous defense wastes (NCAW and 101SY-Cs5) and a Hanford groundwater solution (N-springs). The materials used in this scoping study consisted of the three-dimensional tunnel-structured pharmacosiderites [M3H(AO)(4)(BO4)(3) . 4-6H(2)O (M = H, K; A = Ti, Ge; B = Si, Ge)]; the layered sodium nonatitanate, Na4Ti9O20. XH2O; and two commercially available exchangers, AW-500 and clinoptilolite. Sr-89 and Cs-137 distribution coefficient (K-d) measurements showed that all of the synthetic exchangers removed at least 97% of the Sr-89 from the N-springs groundwater simulant in a single static equilibration. This simulant also contained parts per million levels of Ca2+, Mg2+, K+, and Na+. Similarly, many of the same materials also efficiently removed Cs-137 (>98%) from the same solution, except for sodium titanate, which exhibited the lowest K-d of 1210 mL/g for Cs+. These preliminary K-d values provide an indication that these exchangers may act as dual Cs+ and Sr2+ sorbers for groundwater remediation applications. The different phases were also tested as potential exchangers for Cs-137 and Sr-89 in different nuclear waste simulants. While the materials showed little preference for Cs-137 in highly basic solutions containing large concentrations of NaMO3, a potassium titanosilicate and the sodium titanate yielded Sr-89 K-d values of 20 180 mL/g (DF = 91) and 235 120 mL/g (DF = 1177), respectively.

Keywords: Powder Diffraction Data, Crystal-Structures, Microporous Germanates, Porous Titanosilicate, Synchrotron-Radiation, Conductivity, Cs+, K+, Alkali, Analog

Adgate, J.L., Willis, R.D., Buckley, T.J., Chow, J.C., Watson, J.G., Rhoads, G.G. and Lioy, P.J. (1998), Chemical mass balance source apportionment of lead in house dust. *Environmental Science & Technology*, **32** (1), 108-114.

Full Text: [E\Env Sci Tec32, 108.pdf](E/Env%20Sci%20Tec32,%20108.pdf)

Abstract: Chemical mass balance was used to apportion the major proximate contributors of lead mass to house dust (HDPb) obtained from urban jersey City, NJ, homes of children at risk for lead exposure. Coarse (up to similar to 60 µm) and PM10 (<10 µm) particle size fractions of vacuum dust samples from 64 residences with lead-based paints were analyzed for Ph and 16 other elements. Source profiles were developed to represent proximate source media contributors to HDPb pre-1960 interior lead-based paints, indoor air, and a crustal source profile that accounted for the contribution of yard soils and street dusts. On average for both size fractions the exterior proximate sources, i.e., crustal materials and deposited airborne particulates, were responsible for approximately two-thirds of the HDPb mass, the interior lead-based paint sources contributed the remaining third. Results indicate considerable variability in Pb source contributors between homes, but little difference in the source contributors to the two overlapping size fractions within homes. Effective reduction of HDPb levels will require control of both exterior and interior sources.

Keywords: Models, System, Size

Macaskie, L.E. and Basnakova, G. (1998), Microbially enhanced chemisorption of heavy metals: A method for the bioremediation of solutions containing long lived isotopes of neptunium and plutonium. *Environmental Science & Technology*, **32** (1), 184-187.

Full Text: [E\Env Sci Tec32, 184.pdf](E/Env%20Sci%20Tec32,%20184.pdf)

Abstract: Immobilized cells of a Citrobacter sp. removed neptunium and plutonium negligibly from solution using an established technique that used biologically-produced phosphate ligand (P-i) for metal phosphate bioprecipitation. Removal of these transuranic radionuclides was enhanced by prior exposure of the biomass to lanthanum in the presence of organophosphate substrate to form cell-bound LaPO4. Polyacrylamide gel-immobilized cells removed little Np and Pu per se, but preloaded LaPO4 promoted the removal of Np and Pu upon subsequent challenge in a flow-through column. Approximately 2 µg of Np was loaded per 1 mL, column, when the experiments were stopped after 10 mL, with maintenance of approximately 90% removal of the input metal. Transuranic element removal by this technique, generically described as microbially-enhanced chemisorption of heavy metals (MECHM), is via a hybrid of bioaccumulative and chemisorptive mechanisms.

Keywords: Citrobacter Sp, Uranium, Bioaccumulation, Chemistry, Recovery, Waters, Wastes

Romero, J., Ventura, F., Caixach, J., Rivera, J., Godé, L.X. and Niñerola, J.M. (1998), Identification of 1,3-Dioxanes and 1,3-Dioxolanes as malodorous compounds at trace levels in river water, groundwater, and tap water. *Environmental Science & Technology*, **32** (2), 206-216.

Full Text: [E\Env Sci Tec32, 206.pdf](E/Env%20Sci%20Tec32,%20206.pdf)

Abstract: A study of organic compounds imparting odor problems in river waters and groundwaters has been conducted. The Tordera aquifer located in Barcelona and Girona (NE Spain) is the water supply reserve for many seasonally crowded villages on the coast. Closed loop stripping analysis (CLSA)and flavor profile analysis (FPA) have been employed as analytical tools to identify the compounds responsible for the odor complaints. The feasibility of purge-and-trap (P&T) has also been evaluated. The 2-alkyl-5, 5-dimethyl-1,3-Dioxanes and 2-alkyl-4-methyl-1,3-Dioxolanes were the most significant compounds identified in river water and groundwater with a threshold odor of 10 ng/L for 2-ethyl-5, 5-dimethyl-1,3-Dioxane (2EDD), the most malodorous compound. The analyses were carried out by HRGC/MS, and the synthesized 1,3-Dioxanes and dioxolanes were characterized by CI-MS and EI-MS/MS techniques. A company, currently manufacturing saturated and unsaturated polyester resins, located in the upper course of the river, produced these compounds as byproducts during the synthesis of resins. The pollution by dioxanes and dioxolanes affected all the aquifer and slowly diminished to the ppt levels when the company was forced to correctly treat their wastewaters. Additional examples of the presence of dioxanes and dioxolanes in wastewaters of other resin plants and also tap water of Barcelona are shown.

Keywords: Earthy-Musty Odorants, Drinking-Water, Potable Water, Odorous Compounds, Taste, Chromatography, Flavor

? Graber, E.R. and Borisover, M.D. (1998), Hydration-facilitated sorption of specifically interacting organic compounds by model soil organic matter. *Environmental Science & Technology*, **32** (2), 258-263.

Full Text: [1998\Env Sci Tec32, 258.pdf](1998/Env%20Sci%20Tec32,%20258.pdf)

Abstract: Site-specific interactions between organic compounds and soil organic matter (SOM) may occur at surface sites or limited interior sites; limited sites can have either a specific force component (e.g., hydrogen bonding) or a nonspecific force component (van der Waals) or both. This research addresses sorption specificity to gain an understanding of SOM structure. Sorption of phenol, pyridine, and atrazine on Pahokee peat, a mineral-free SOM endmember, was measured as a function of so lute activity in hydrated and dehydrated conditions. Sorption of phenol and pyridine from water at low solute activities was the same as from n-hexadecane; sorption at high solute activities was much greater from water than from n-hexadecane. Uptake of atrazine at high activities was not influenced by peat hydration. Sorption isotherms measured in nonaqueous systems were more nonlinear than those measured in water. The increase in sorption on hydrated peat at high pyridine and phenol activities is attributed to an increase in sorption sites resulting from penetration of solute molecules between polar peat contacts which are either previously solvated by water or solvated during penetration of the solute. High solute activities are necessary for simultaneous disruption of multiple points of contact in the hydrated SOM macromolecular complex.

Keywords: Water, Atrazine

Macdonald, R.W., Ikonomou, M.G. and Paton, D.W. (1998), Historical inputs of PCDDs, PCDFs, and PCBs to a British Columbia interior lake: The effect of environmental controls on pulp mill emissions. *Environmental Science & Technology*, **32** (3), 331-337.

Full Text: [E\Env Sci Tec32, 331.pdf](E/Env%20Sci%20Tec32,%20331.pdf)

Abstract: A sediment core collected from Kamloops Lake, British Columbia, was used to assess historical inputs of polychlorinated dioxin and furans (PCDD/Fs) from a pulp mill and the effects of recent environmental controls. Principal components analysis reveals that four groups of compounds can be found in the sediments: moderately chlorinated PCDD/Fs produced during the bleaching of pulp with chlorine (e.g., TCDF), PCDD/Fs that have been produced by condensation of polychlorinated phenoxyphenol contaminants during pulping (e.g., HxCDDs), highly chlorinated PCDD/Fs that are derived from mixed sources (e.g., OCDD), and a series of PCBs that are probably derived from mixed sources. Strong correlations of CB13, CB15, and CB37 with the moderately chlorinated PCDD/Fs suggest that these PCBs have been produced in-situ by the pulp mill. In particular, CB15 is found in quantities rivaling those of total TCDF. In the 1930s-1950s, sediments exhibit minor contamination by the PCBs and higher chlorinated dioxins and furans. With the construction of the mill in 1965, large quantities of HxCDD and the tetra-chlorinated PCDD/Fs were released. Technological changes at the pulp mill have effected a drastic reduction in pulp mill PCDD/Fs in the 1990s.

Keywords: Polychlorinated Biphenyl Congeners, Isomer-Specific Determination, Principal Component Analysis, Bleached Kraft Pulp, Dibenzo-p-Dioxins, Chlorinated Hydrocarbons, Sediments, Combustion, Fate, Effluent

Notes: highly cited

Raven, K.P., Jain, A. and Loeppert, R.H. (1998), Arsenite and arsenate adsorption on ferrihydrite: Kinetics, equilibrium, and adsorption envelopes. *Environmental Science & Technology*, **32** (3), 344-349.

Full Text: [E\Env Sci Tec32, 344.pdf](E/Env%20Sci%20Tec32,%20344.pdf)

Abstract: Because of its toxicity, arsenic is of considerable environmental concern. Its solubility in natural systems is strongly influenced by adsorption at iron oxide surfaces. The objective of this study was to compare the adsorption behavior of arsenite and arsenate on ferrihydrite, under carefully controlled conditions, with regard to adsorption kinetics, adsorption isotherms, and the influence of pH on adsorption. The adsorption reactions were relatively fast, with the reactions almost completed within the first few hours. At relatively high As concentrations, arsenite reacted faster than arsenate with the ferrihydrite, i.e., equilibrium was achieved sooner, but arsenate adsorption was faster at low As concentrations and low pH. Adsorption maxima of approximately 0.60 (0.58) and 0.25 (0.16) mol(As), mol(Fe)-1 were achieved for arsenite and arsenate, respectively, at pH 4.6 (pH 9.2 in parentheses). The high arsenite retention, which precludes its retention entirely as surface adsorbed species, indicates the likelihood that ferrihydrite was transformed to a ferric arsenite phase, although this possibility has yet to be confirmed by spectroscopic studies. The general trend at initial arsenic concentrations greater than or equal to 0.27 mol(As) kg-1 ferrihydrite within the pH range of 4-9 was increasing arsenite adsorption and decreasing arsenate adsorption with increasing pH. At initial As concentrations of 0.27-0.80 mol(As), kg-1 ferrihydrite, the adsorption envelopes crossed at approximately pH 6-7.5, i.e., adsorbed arsenate concentrations were relatively greater than adsorbed arsenite concentrations at lower pH values whereas adsorbed arsenite was greater at higher pH. At the highest initial arsenic concentration of 13.3 mol(As) kg-1 ferrihydrite, a distinct adsorption maximum was observed for arsenite adsorption at approximately pH 9.0, which corresponds closely to the first pK(a) (9.2) of H3AsO30, whereas there was a continuous drop in arsenate adsorption with increasing pH from 3 to 11.

Keywords: Amorphous Iron Hydroxide, Aqueous-Solution, Chemistry, Phosphate, Selenium, Removal, Oxides, pH

Li, Z.M., Yu, J.W. and Neretnieks, I. (1998), Electroremediation: Removal of heavy metals from soils by using cation selective membrane. *Environmental Science & Technology*, **32** (3), 394-397.

Full Text: [E\Env Sci Tec32, 394.pdf](E/Env%20Sci%20Tec32,%20394.pdf)

Abstract: When the electroremediation is used to remove heavy metals from soils, metals may precipitate as hydroxides near the cathode where the pH is raised, which limits the remediation efficiency. The pH rise is caused by the generation of hydroxyl ions as a result of cathodic hydrogen evolution reaction during the remediation. in previous studies, a method to deal with the pH impact was developed. In the method, to prevent the transport of the hydroxyl ions into the soil being treated, a length of tube filled with solution and containing no soil is placed between the cathode and the soil. The heavy metals can then preciptate in the water instead of in the soil. In this study, a new method is proposed and developed. A cation selective membrane is placed in front of the cathode to stop the advancement of hydroxyl front toward the a node. This can considerably reduce the water volume needed, while ensuring that the soil being treated is at low pH condition. Thus, metal precipitation could not occur in the soil and heavy metals may migrate out of the soil, and precipitate in the water. Some unexpected phenomena were encounted and solved. Bench-scale experiments have been conducted to remove copper from sand by the method. The experimental results show that a removal efficiency higher than 90% can be reached.

Keywords: Electrokinetic Remediation, Electric-Fields, Kaolinite, Electroosmosis, Contaminants

Hansen, D., Duda, P.J., Zayed, A. and Terry, N. (1998), Selenium removal by constructed wetlands: Role of biological volatilization. *Environmental Science & Technology*, **32** (5), 591-597.

Full Text: [E\Env Sci Tec32, 591.pdf](E/Env%20Sci%20Tec32,%20591.pdf)

Abstract: Selenium-laden effluents from oil refineries are polluting San Francisco Bay, California. One environmentally friendly way of cleaning up selenium (Se) from effluents is by plant and microbial Se volatilization using constructed wetlands. Using mesocosms, we investigated the role of biological Se volatilization in a 36-ha constructed wetland located adjacent to San Francisco Bay. The constructed wetland was highly effective in removing Se from selenite-contaminated oil refinery wastewater: 89% of the Se was removed. Inflow Se concentrations of 20-30 µg L-1 decreased to <5 µg L-1 in the outflow. Most of the Se was removed by immobilization into sediments and plant tissues where Se concentrations reached similar to 5 and similar to 15 mg kg-1, respectively. Biological volatilization may have accounted for as much as 10-30% of the Se removed. The highest mean rates of Se volatilization for vegetated sites were 190, 180, and 150 µg of Se m-2 day-1 (rabbitfoot grass, cattail, and saltmarsh bulrush, respectively). Rates for the most dominant species, saltmarsh bulrush, varied during the year: the mean rates were 150, 70, and 25 µg of Se m-2 day-1 in February, June, and October, respectively. We conclude that biological Se volatilization is a significant pathway of Se removal in wetlands.

Keywords: Kesterson Reservoir, Transformations, Soil, Chemistry, Sediment, Carbon, Rates

Meima, J.A. and Comans, R.N.J. (1998), Application of surface complexation precipitation modeling to contaminant leaching from weathered municipal solid waste incinerator bottom ash. *Environmental Science & Technology*, **32** (5), 688-693.

Full Text: [E\Env Sci Tec32, 688.pdf](E/Env%20Sci%20Tec32,%20688.pdf)

Abstract: In this paper, we have successfully applied surface complexation/precipitation modeling to describe the leaching of contaminants from weathered municipal solid waste incinerator (MSWI) bottom ash. A combination of ‘selective’ chemical extractions and leaching at pH values unfavorable for sorption has been shown to be useful for obtaining sorbent mineral and sorbate concentrations. Model calculations are based on the Diffuse Layer Model and a database of sorption constants for hydrous ferric oxide (HFO), both of which are incorporated in the computer code MINT-EQA2. This approach to sorption modeling shows that the leaching of Mb, Pb, and Cu from weathered MSWI bottom ash is well described by surface complexation, whereas the surface precipitation model is needed to describe the leaching data of Zn. The leaching of Cd cannot be explained with these models since the affinity of Cd for HFO is too low. Our results suggest that Mo and Zn are bound mainly to HFO. Additional sorbent minerals, e.g., amorphous aluminum (hydr)oxides, are required to describe the leaching of Cu and Pb.

Keywords: Fuel Combustion Residues, Inorganic Constituents, Fly-Ash, Sorption, Speciation, Adsorption, Iron, Mobilization, Elements, Cations

Bonn, B.A. (1998), Polychlorinated dihenzo-p-dioxin and dibenzofuran concentration profiles in sediment and fish tissue of the Willamette Basin, Oregon. *Environmental Science & Technology*, **32** (6), 729-735.

Full Text: [E\Env Sci Tec32, 729.pdf](E/Env%20Sci%20Tec32,%20729.pdf)

Abstract: Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/F) are highly hydrophobic compounds that have been implicated as carcinogens and, more recently, as estrogen disrupters. An occurrence and distribution study of these compounds in the Willamette Basin, Oregon, was conducted by the U.S. Geological Survey as part of the National Water-Quality Assessment Program. Bed sediment was collected from 22 sites, fish tissue was collected from eight sites. PCDD/F were found to be ubiquitous in Willamette Basin sediment. A distinct homolog profile, dominated by octachlorodibenzo-p-dioxin, was observed in sediment throughout the basin. The PCDD homolog profile was consistent at all sites, regardless of total PCDD/F concentration, presence of point sources, subbasin size, geographic location or land use. Principal components analysis revealed a gradient among the homolog profiles that showed increasing dominance of highly chlorinated congeners where human and industrial activity increased. Tissue and bed sediment obtained from the same site did not have similar PCDD/F concentrations or homolog profiles. Fish tissue showed enrichment in less chlorinated congeners and congeners with chlorine substitutions in the 2, 3, 7 and 8 positions.

Keywords: Chlorinated Dioxins, PCDD, Soil, Deposition, Patterns, Furans, River, Water, UK

Daughney, C.J. and Fein, J.B. (1998), Sorption of 2,4,6-trichlorophenol by *Bacillus subtilis*. *Environmental Science & Technology*, **32** (6), 749-752.

Full Text: [E\Env Sci Tec32, 749.pdf](E/Env%20Sci%20Tec32,%20749.pdf)

Abstract: The mobility of 2,4,6-trichloraphenol (TCP) in groundwater may be controlled, in part, by its sorption onto bacterial surfaces. In this study, we perform batch experiments as a function of pH, time, and solid-to-solution ratio to investigate the sorption of TCP by the common soil bacterium Bacillus subtilis. We first describe the experimental data with a hydrophobic partitioning model, in which sorption is controlled by the speciation of the TCP a nd the concentration of bacteria present. This model provides an adequate description of the data below pH 8 but overpredicts sorption in more basic solutions, where negligible sorption is observed for all solid-to-solution ratios. TCP-B. subtilis sorption is better described by a surface complexation model in which both the negative and the neutral forms of TCP form 1: 1 surface complexes with the neutral hydroxyl functional groups of the bacteria: R-OH0 + TCP- <-> R-OH-TCP- (log K = 3.01±0.50) and R-OH0 + HTCP0 <-> R-OH-HTCP0 (log K = 3.77±0.50). These stability constants may be incorporated into thermodynamic models to predict the fate of TCP in complex systems.

Keywords: Chlorinated Phenols, Chlorophenols, Pentachlorophenol, Toxicity, pH

Wen, X.H., Du, Q. and Tang, H.X. (1998), Surface complexation model for the heavy metal adsorption on natural sediment. *Environmental Science & Technology*, **32** (7), 870-875.

Full Text: [E\Env Sci Tec32, 870.pdf](E/Env%20Sci%20Tec32,%20870.pdf)

Abstract: Surface complexation models (SCMs) have been successfully used to describe metal ion adsorption on pure mineral materials. However, such models have rarely been applied to model adsorption on natural materials. In this study, the surface complexation model approach was used to describe the surface properties and adsorption behavior of natural aquatic sediment. Three typical versions of the surface complexation model were used: constant capacitance model (CCM), diffuse layer model (DLM), and triple layer model (TLM). All the model parameters were determined on the basis of the experimental data of the potentiometric titration and the metal adsorption isotherm using LeAn River (China) sediment. The experimental data of the adsorption edges were used to verify the performance of the models. This work indicated that all three models can simulate the experimental results very well. In predicting the adsorption behavior of the sediment sample, the relative errors of these three models were quite close. The results illustrate that SCMs can be used to successfully model natural materials.

Keywords: Oxide-Water Interface, Phosphate Adsorption, Chemical-Model, Fresh Waters, Cadmium, Stabilities, Ionization, Strategy, Coverage, Systems

Notes: highly cited

Cornelissen, G., Rigterink, H., Ferdinandy, M.M.A. and van Noort, P.C.M. (1998), Rapidly desorbing fractions of PAHs in contaminated sediments as a predictor of the extent of bioremediation. *Environmental Science & Technology*, **32** (7), 966-970.

Full Text: [E\Env Sci Tec32, 966.pdf](E/Env%20Sci%20Tec32,%20966.pdf)

Abstract: In the present study, the desorption kinetics of 15 PAHs (two to six rings) from sediments were determined before and after bioremediation in a bioreactor or landfarm. Desorption kinetics were measured with a method in which the water phase was kept PAH-free by Tenax TA beads. For almost all degraded PAHs, rapidly desorbing fractions (desorption rate constants > 0.1 h-1) were much smaller after bioremediation than before treatment whereas the slowly desorbing amounts remained unchanged. Thus, mainly the rapidly desorbing PAHs are degraded during bioremediation. The extent of possible PAH degradation could be roughly predicted from the initial rapidly desorbing fraction. For nondegraded PAHs, the rapidly desorbing fractions were substantial (up to 55%) and remained unchanged by remediation. The magnitude of the rapidly desorbing fractions of the nondegraded PAHs suggests that their persistence is due to microbial factors, not bioavailability.

Keywords: Polycyclic Aromatic-Hydrocarbons, Sewage-Sludge, Fresh-Water, Desorption Hysteresis, Organic-Chemicals, Degradation Rates, Aquifer Solids, Soil, Sorption, Naphthalene

Rampley, C.G. and Ogden, K.L. (1998), Preliminary studies for removal of lead from surrogate and real soils using a water soluble chelator: Adsorption and batch extraction. *Environmental Science & Technology*, **32** (7), 987-993.

Full Text: [E\Env Sci Tec32, 987.pdf](E/Env%20Sci%20Tec32,%20987.pdf)

Abstract: A technique for removing Pb from contaminated soil is to wash excavated soil with a solution containing a chelating agent specific for the heavy metal contaminant of interest. Parameters needed to demonstrate the plausibility of this remediation method include the amount of chelator adsorption to soil and the rate of Pb extraction. This paper investigates these parameters for a newly developed water-soluble chelator, Metaset-Z, which has a high specificity for Pb. Metaset-Z chelated Pb in aqueous solutions on the time scale of seconds. This chelator has a low affinity for quartz. Its adsorption is independent of ionic strength over the range tested. Mini column experiments demonstrated that Metaset-Z adsorption is also independent of polymer, Ca, and Pb aqueous-phase concentrations. Removal of Pb to below EPA requirements was achieved using both surrogate, quam contaminated soil and a Superfund contaminated soil. A one-site semiempirical, equilibrium reaction model fit the surrogate soil extraction data well, a two-site reaction model fit the contaminated soil data well. Overall, this study shows that Metaset-Z can be used as a batch extractant for Pb-contaminated soil.

Keywords: Kinetics, Media

? Vandevivere, P., Ficara, E., Terras, C., Julies, E. and Verstraete, W. (1998), Copper-mediated selective removal of nitrification inhibitors from industrial wastewaters. *Environmental Science & Technology*, **32** (7), 1000-1006.

Full Text: [1998\Env Sci Tec32, 1000.pdf](1998/Env%20Sci%20Tec32,%201000.pdf)

Abstract: Current efforts to upgrade wastewater treatment plants focus on biological N and P removal. N removal is often limited by the rate of nitrification, which is sensitive to low concentrations of specific inhibitors present in industrial effluents. Many known nitrification inhibitors act by complexing the copper enzyme ammonium monooxygenase and can be counteracted via Cu(II) addition. We found here, using both a batch inhibition test and bench-scale semi-continuous activated sludge reactors, that the inhibition of nitrification with four industrial wastewaters was greatly reduced when Cu(II) was added and that Cu(I) or even particulate Cu(O) were at times the most effective forms. Conventional remedial additives, such as activated carbon or zeolite, were not effective. Because direct Cu(II) addition would lead to undesirable contamination of waste-activated sludge, a pretreatment process using reusable surface-immobilized forms of copper was sought. Surface-immobilized copper [e.g., particulate Cu(O), Cu(II)-loaded chelating resins] was more efficient than soluble Cu(II) in detoxifying an industrial effluent and model inhibitor solution, XPS analysis suggests a surface complexation mechanism. The immobilized copper phases can be reused repeatedly in a pretreatment contact unit and regenerated upon saturation.

Keywords: Ammonia Oxidation, Nitrosomonas, Biochemistry, Plants

Khandelwal, A., Rabideau, A.J. and Shen, P.L. (1998), Analysis of diffusion and sorption of organic solutes in soil-bentonite barrier materials. *Environmental Science & Technology*, **32** (9), 1333-1339.

Full Text: [E\Env Sci Tec32, 1333.pdf](E/Env%20Sci%20Tec32,%201333.pdf)

Abstract: A series of laboratory studies was conducted to assess the transport of chloride, trichloroethylene (TCE), and aniline in soil-bentonite (SB) slurry wall materials. Column transport experiments were conducted, with a primary emphasis on the measurement of spatial contaminant mass profiles within columns after 25-50 days of transport under diffusion-dominated conditions. The advective-dispersive-reactive (ADR) equation was found to provide good predictions of the results of the column experiments with calibrated diffusion parameters that were within the range observed by other researchers for earthen barrier materials. However, Values of the porosity-corrected hindrance factor were higher than those observed in, other studies of diffusive transport in SE, and sorption coefficients calibrated from the column experiments were significantly lower than values measured in batch isotherm tests conducted with unconsolidated SE. A number of factors could contribute to variability across experiments and investigators, including differences between batch and column conditions, differences in experimental apparatus and design used to study diffusive transport in SE, correlation between parameters in the calibration process, and the potential influence of nonequilibrium sorption in column experiments. For the design of conventional slurry walls, it is likely that conservative predictions of organic contaminant penetration can be obtained with the ADR equation using established correlations for effective diffusion coefficients and neglecting sorption to barrier materials.

Keywords: Restricted Diffusion, Transport, Sites, Clay, Contaminants, Adsorption, Migration, Ontario, Liners, Water

Opperhuizen, A. and Schrap, M. (1998), Comment on “Temperature dependence of slow adsorption and desorption kinetics of organic compounds in sediments”. *Environmental Science & Technology*, **32** (9), 1359.

Full Text: [E\Env Sci Tec32, 1359.pdf](E/Env%20Sci%20Tec32,%201359.pdf)

Cornelissen, G., van Noort, P.C.M., Parsons, J.R. and Govers, H.A.J. (1998), Response to comment on “Temperature dependence of slow adsorption and desorption kinetics of organic compounds in sediments”. *Environmental Science & Technology*, **32** (9), 1360.

Full Text: [E\Env Sci Tec32, 1360.pdf](E/Env%20Sci%20Tec32,%201360.pdf)

Webster, J.G., Swedlund, J. and Webster, K.S. (1998), Trace metal adsorption onto an acid mine drainage iron(III) oxy hydroxy sulfate. *Environmental Science & Technology*, **32** (10), 1361-1368.

Full Text: [E\Env Sci Tec32, 1361.pdf](E/Env%20Sci%20Tec32,%201361.pdf)

Abstract: The adsorption properties of Fe-rich precipitates in acid mine drainage (AMD) systems differ from those of pure hydrous iron(III) oxides, and this can lead to inaccurate predictions of trace metal adsorption and attenuation. Adsorption edges for Cu, Pb, Zn and Cd adsorption onto a poorly ordered, goethite-bearing iron(III) oxy hydroxy sulfate, precipitated in an AMD system in New Zealand, have been compared to those for adsorption onto synthetic schwertmannite and two-line ferrihydrite. Adsorption of Cuand Znonto the AMD iron(III) oxy hydroxy sulfate was greater than onto synthetic schwertmannite, which was in turn greater than onto two-line ferrihydrite. The two factors considered most likely to enhance Cuand Znadsorption on the AMD iron(III) oxy hydroxy sulfate were (i) the formation of ternary complexes between the oxide surface, adsorbed SO4 and the metal ion and (II) bacterially mediated formation of the AMD precipitate. Cd adsorption was similarly enhanced on AMD iron(III) oxy hydroxy sulfate but unaffected by SO4, which did not adsorb at the relatively high pH conditions required for Cd adsorption. Although Pbdid appear to form ternary complexes with SO4, Pbadsorption onto both AMD iron(III) oxy hydroxy sulfate and synthetic schwertmannite was less than adsorption onto two-line ferrihydrite.

Schroth, B.K. and Sposito, G. (1998), Effect of landfill leachate organic acids on trace metal adsorption by kaolinite, *Environmental Science & Technology*, **32** (10), 1404-1408.

Full Text: [E\Env Sci Tec32, 1404.pdf](E/Env%20Sci%20Tec32,%201404.pdf)

Abstract: Hexanoic (hex) and fulvic acid (FA), representing early and later stages of landfill leachate evolution, were examined for influence on trace metal adsorption by a poorly crystallized kaolinite (KGa-2). Our experiments represented a model approach to examine possible reaction mechanisms in an environmentally important ternary metal-ligand-mineral surface system. Batch experiments were conducted in 0.01 molkg-1 NaClO4 at pH 3-8. Concentrations of metals (Cu, Cd, and Pb) and ligands were representative of those found typically in groundwater immediately downgradient of a landfill. The presence of FA resulted in enhancement of metal adsorption below pH 5, whereas the presence of hex produced no significant net change in metal uptake. Measured surface charge properties of KGa-2 were combined with binary and ternary system data in constructing a quantitative model of the system. The simple combination of binary system results was not effective in predicting the observed ternary system behavior. In both ternary systems, the addition of ternary surface complexes (TSCs) to the models resulted in a satisfactory fit to the data. Our work suggests the strong possibility that TSC involvement in surface reactions of natural adsorbents may be a useful concept.

Notes: highly cited

? Desbrow, C., Routledge, E.J., Brighty, G.C., Sumpter, J.P. and Waldock, M. (1998), Identification of estrogenic chemicals in STW effluent. 1. Chemical fractionation and in vitro biological screening. *Environmental Science & Technology*, **32** (11), 1549-1558.

Full Text: [1998\Env Sci Tec32, 1549.pdf](1998/Env%20Sci%20Tec32,%201549.pdf)

Abstract: A fractionation system, combined with an in vitro assay for detecting estrogenic activity, was developed in order to isolate and identify the major-estrogenic chemicals present in seven sewage-treatment works (STW) effluents, receiving primarily domestic effluent, discharging into British rivers. Three sterols were isolated from estrogenic fractions of sewage extracts; these were the natural hormones 17 beta-estradiol and estrone and the synthetic hormone 17 alpha-ethynylestradiol. 17 beta-Estradiol and estrone were present in all the effluents at measured concentrations ranging from 1 ng/L to almost 50 and 80 ng/L, respectively. The concentration of 17 alpha-ethynylestradiol was generally below the limit of detection but was positively identified in three of the effluent samples at concentrations ranging from 0.2 to 7.0 ng/L. These data suggest that natural and synthetic hormones may be responsible for the observed induction of vitellogenin synthesis in male fish placed downstream of effluent discharges from STWs that receive mainly domestic inputs.

Keywords: Biological, Chemicals, Concentration, Data, Discharges, Effluents, Estrogenic Chemicals, Fish, Fractionation, Hormones, Induction, Male, Natural, Rivers, Screening, Sediment, Sewage, Synthesis, Toxicity, Vitellogenin

Notes: highly cited

? Routledge, E.J., Sheahan, D., Desbrow, C., Brighty, G.C., Waldock, M. and Sumpter, J.P. (1998), Identification of estrogenic chemicals in STW effluent. 2. In vivo responses in trout and roach. *Environmental Science & Technology*, **32** (11), 1559-1565.

Full Text: [1998\Env Sci Tec32, 1559.pdf](1998/Env%20Sci%20Tec32,%201559.pdf)

Abstract: The occurrence of certain natural and synthetic steroidal estrogens in the final effluent from STW has been demonstrated. 17 beta-Estradiol and estrone were present at concentrations in the tens of nanograms per liter range, and the synthetic estrogen 17 alpha-ethynylestradiol was also identified, albeit in the low nanogram per liter range. The findings from subsequent in vivo tank trial experiments, in which adult male rainbow trout (Oncorhynchus mykiss) and adult roach (Rutilus rutilus) were exposed for 21 days via the water to environmentally relevant concentrations of 17 beta-estradiol and estrone are presented. In addition, the response of adult male and female roach following exposure to 17 beta-estradiol (1, 10, and 100 ng/L) was compared to the response to the alkylphenolic xenoestrogen, 4-tert-octylphenol (1, 10 and 100 mu g/L). plasma levels of vitellogenin were determined using previously validated radioimmunoassays in order to measure the estrogenic response of the fish to the varying concentrations of the compounds tested. The results indicate that environmentally relevant concentrations of natural steroidal estrogens are sufficient to account for the levels of vitellogenin synthesis observed in caged male fish placed downstream of certain STW effluent discharges in British rivers.

Keywords: Adult, Androgen, Aquatic Environment, Biomarker, Chemicals, Cyprinus-Carpio, Discharges, Estrogen, Estrogenic Chemicals, Experiments, Exposure, Female, Fish, Male, Measure, Natural, Plasma, Rainbow Trout, Rainbow-Trout, Rivers, Roach, Synthesis, Trial, Trout, Vitellogenin, Water

Sarret, G., Manceau, A., Spadini, L., Roux, J.C., Hazemann, J.L., Soldo, Y., Eybert-Berard, L. and Menthonnex, J.J. (1998), Structural determination of Zn and Pb binding sites in *Penicillium chrysogenum* cell walls by EXAFS spectroscopy. *Environmental Science & Technology*, **32** (11), 1648-1655.

Full Text: [E\Env Sci Tec32, 1648.pdf](E/Env%20Sci%20Tec32,%201648.pdf)

Abstract: Fungal cell walls possess strong complexing properties, which make them valuable biosorbents to remove heavy metals from wastewaters. The binding mechanisms of Zn and Pb to *Penicillium chrysogenum* cell walls have been studied by solution chemistry and extended X-ray absorption fine structure (EXAFS) spectroscopy as a function of the complexation rate. It is shown that Zn and Pb bind to the predominant phosphoryl (approximate to 95%) and minor carboxyl groups (approximate to 5%) with a reversed affinity. Zn is predominantly complexed to four PO4 groups in a tetrahedral configuration at low (7.6×10-3 mmol/g) to high (0.15 mmol/g) Zn concentration and additionally to COOH groups at total saturation of reactive sites (0.22 mmol/g). In contrast, carboxyl complexes of Pb (= (COO)(n)-Pb) are formed at low Pb concentration (5.6 10-3 mmol/g), and their formation is followed by = (PO4)(n)-Pb complexes at higher complexation rate. The difference in complexation affinity by reactive PO4 and COOH groups observed by EXAFS provides a molecular level explanation for the differences in Pb and Zn isotherms. The Pb isotherm exhibits two plateaus, which correspond to the successive saturation of COOH and PO4 sites, whereas the Zn isotherm has a single-site Langmuir shape because low affinity minor = (COO)(n)-Zn complexes formed at high metal concentration are masked by more abundant = (PO4)(4)-Zn complexes, which readily form.

Keywords: Rhizopus-Arrhizus, Cadmium, Biosorption, Metals, Oxides, Fungi, Soils, Lead, Zinc

Kähkönen, M.A., Suominen, K.P., Manninen, P.K.G. and Salkinoja-Salonen, M.S. (1998), 100 years of sediment accumulation history of organic halogens and heavy metals in recipient and nonrecipient lakes of pulping industry in Finland. *Environmental Science & Technology*, **32** (12), 1741-1746.

Full Text: [E\Env Sci Tec32, 1741.pdf](E/Env%20Sci%20Tec32,%201741.pdf)

Abstract: Rate of sediment accumulation of extractable organic halogen (EOX) and of 12 trace elements (As, Cd, Co, Cr, Cu, Hg, Mn, Ni, Pb, Sn, V, and Zn) were analyzed retrospectively over 100 years in the recipient area of pulp mills in Lake Saimaa and in two nonrecipient forest lakes in southeastern Finland. The sediments were dated by Pb-210 and Cs-137 activities. From 1880s to 1940s, <1 mg of EOX-Cl accumulated m-2 year-1 in the sediment of southeastern Lake Saimaa, but accumulation increased to 1350 mg of EOX-Cl m-2 year-1 from the 1950s to the 1980s at 3 km and to 500 mg at 5 km from the discharge point of bleaching pulp mills. Abandoning elemental chlorine in bleaching and adopting biological treatment for wastewaters in the 1990s associated with a decreasing the sediment accumulation of EOX to <400 mg of EOX-Cl m-2 year-1 at both sites. The deposition rates of inorganic elements were similar in all three lakes from 1880s to 1940s, 5-40 mg m-2 year-1 for Mn and Zn, 1-5 mg m-2 year-1 for Cr, Cu, Ni, Pb, Sn, and V, and below 1 mg m-2 year-1 for As, Cd, Co, and Hg. After the 1950s, the sediment accumulation rates of Cd, Cr, Cu, Hg, Ni, Pb, Sn, Zn, and carbon increased 2-5-fold in the recipient lake and those of Pb, Hg, and Sn also in the nonrecipient lakes. From each ton of adsorbable organic halogen (AOX) discharged by the mills, 0.6-0.1 mg of EOX-Cl m-2 accumulated in the Lake Saimaa sediments at 3-5 km from the mills. From the slope of sediment accumulation vs time, the half-life of the EOX of pulp mill origin in the sediment was estimated as 60-80 years. The rates of sediment accumulation of Hg during the decades when organomercurials were used as slimicides show that sediment was not the main sink for the Hg.

Keywords: Power-Plant, Pollution, Vanadium, Nickel

Kannan, N., Yamashita, N., Petrick, G. and Duinker, J.C. (1998), Polychlorinated biphenyls and nonylphenols in the Sea of Japan. *Environmental Science & Technology*, **32** (12), 1747-1753.

Full Text: [E\Env Sci Tec32, 1747.pdf](E/Env%20Sci%20Tec32,%201747.pdf)

Abstract: Determination of polychlorinated biphenyls (PCBs) and nonylphenols (NoPhs) in the Sea of Japan not only points out the extent of marine pollution but also helps to understand the deep sea structure of that semi-enclosed “small ocean”. Using an in-situ filtration/extraction technique, two vertical profiles (deep water and shallow coastal water) and two space-integrated surface profiles were taken. Concentrations of Sigma CBs (sum of 30 individual congeners) in solution were between 0.1 and 1.2 pg dm-3 and in suspension were between 0.2 and 1.5 pg dm-3, those of Sigma NoPhs in solution were 2-150 pg dm-3 and below detection limits in suspension. The concentrations of Sigma CBs and nonylphenols in solution as well as the compositions of the CB mixtures in solution in the vertical profile indicates a vertical structure similar to the situation in the open ocean as suggested by Kim (Biogeochemical processes in the North Pacific, Tsunogai, S., Ed., Japan Marine Science Foundation: Tokyo 1996, pp 41-51). The concentrations of CBs in solution were determined primarily by chara cteristics of the water bodies involved, solution-suspension interactions playing only a minor role. Principal component analyses of the data revealed a relation between deep and bottom waters and surface waters of the nearby region.

Keywords: Multidimensional Gas-Chromatography, Electron-Capture Detection, Water, Mixtures

Morf, L.S. and Brunner, H. (1998), The MSW incinerator as a monitoring tool for waste management. *Environmental Science & Technology*, **32** (12), 1825-1831.

Full Text: [E\Env Sci Tec32, 1825.pdf](E/Env%20Sci%20Tec32,%201825.pdf)

Abstract: For efficient waste management, instruments are needed to assess the impact of legislative, organizational, and technical measures on the waste stream. Since waste incineration plants transform heterogeneous wastes into more homogeneous residues, they are well suited for easy and cost-effective monitoring of the chemical composition of wastes. A method is proposed to determine changes in the chemical waste composition by analyzing a single incineration residue only. Procedures are presented to (a) select the appropriate incineration residue to be analyzed, (b) determine the minimum sampling frequency of the residue, and (c) analyze? the chemical composition of municipal solid waste routinely with a given accuracy. Field measurements demonstrate that, with a reasonable effort, the annual mean concentration of Zn and Cd in MSW can be determined with an uncertainty of less than 10% and of Cu and Pb with less than 20%, respectively. The proposed method, which can be extended to nonmetals also, serves as a base to use waste incineration plants as a routine tool for quality control in waste management.

Keywords: Municipal Solid-Waste

Agnihotri, R., Chauk, S., Mahuli. S. and Fan, L.S. (1998), Selenium removal using Ca-based sorbents: Reaction kinetics. *Environmental Science & Technology*, **32** (12), 1841-1846.

Full Text: [E\Env Sci Tec32, 1841.pdf](E/Env%20Sci%20Tec32,%201841.pdf)

Abstract: Selenium, along with mercury and halides, represents one of the most volatile trace metallic emissions from coal-fired combustors and utility boilers. Calcium-based sorbents are shown to capture selenium oxide via a chemical reaction leading to the formation of calcium selenite. In this study, intrinsic kinetics of this chemical interaction is investigated. Experiments are conducted to obtain initial reaction rate and to determine basic kinetic parameters such as activation energy of the reaction, order of reaction with respect to the gas-phase selenium concentration, and influence of sorbent initial surface area. Experimental investigations are conducted in a differential-bed flow-through reactor system at 400-600°C temperature conditions with SeO2 partial pressure in the range of 5-30 Pa. Activation energy of the reaction of 4.03 kcal/gmol is obtained, and the reaction is found to have an order of 0.67, with respect to SeO2 partial pressure. Rate of reaction is determined to vary with the initial sorbent surface area. Sorption of selenium oxide in the presence of SO2 in the gas phase suggests that the two reactions are competitive, and the formation of CaSeO3 is considerably slower than the sulfation of the sorbent when the concentration of the two species in the gas phase is comparable. This suggests that the reaction between sorbent particles and SeO2 is insignificant in the presence of SO2.

Keywords: High-Temperature, Metal Emissions, Trace-Elements, Solid Sorbents, Flue-Gases, Mechanism, Filters, Capture, SO2

Clemons, J.H., Allan, L.M., Marvin, C.H., Wu, Z., McCarry, B.E., Bryant, D.W. and Zacharewski, T.R. (1998), Evidence of estrogen- and TCDD-like activities in crude and fractionated extracts of PM10 air particulate material using in vitro gene expression assays. *Environmental Science & Technology*, **32** (12), 1853-1860.

Full Text: [E\Env Sci Tec32, 1853.pdf](E/Env%20Sci%20Tec32,%201853.pdf)

Abstract: Polar and nonpolar fractions prepared from an organic extract of inhalable air particulate material collected from an urban location in downtown Toronto, Ontario, Canada, were examined for estrogen and Ah receptor-mediated activities using in vitro gene expression assays. The presence of estrogenic activity was determined using MCF-7 human breast cancer cells transiently transfected with a Gal4-human estrogen receptor chimera and a Gal4-regulated luciferase reporter gene. 2,3,7,8-Tetracholordibenzo-p-dioxin (TCDD)-like activity was detected using Hepa 1c1c7 cells transiently transfected with a CYP1A1-regulated reporter gene (pGudLuc 1.1). Significant estrogenic and TCDD-like activity was detected in the crude extract and in the nonpolar fractions. Results from the analyses of nine environmentally prevalent polyaromatic hydrocarbons (PAH) indicated that PAH might be significant contributors to the observed activity. Surprisingly, three PAH, namely benzo[a]pyrene, chrysene, and benz[a]anthracene, were found to substantially induce in vitro estrogenic and TCDD-like activities that were mediated by the estrogen and Ah receptors, respectively. Benzo[k]fluoranthene, dibenz[a, h]anthracene, and anthracene also exhibited significant in vitro TCDD-like activity. These results demonstrate the utility of in vitro gene expression assays to identify the presence of potential endocrine disrupters within complex mixtures.

Keywords: Aryl-Hydrocarbon Hydroxylase, Human-Breast-Cancer, Responsive Transcriptional Enhancer, Polynuclear Aromatic-Hydrocarbons, Protein-DNA Interactions, Liver-Cell Lines, AH-Receptor, MCF-7 Cells, Binding, Bioassay

Addink, R., Govers, H.A.J. and Olie, K. (1998), Isomer distributions of polychlorinated dibenzo-*p*-dioxins/dibenzofurans formed during De Novo synthesis on incinerator fly ash. *Environmental Science & Technology*, **32** (13), 1888-1893.

Full Text: [E\Env Sci Tec32, 1888.pdf](E/Env%20Sci%20Tec32,%201888.pdf)

Abstract: Polychlorinated dibenzo-p-dioxins (PCDD) and dibenzofurans (PCDF) emitted from municipal waste incinerators appear to have a chlorination pattern that is quite constant across various samples and conditions. This suggested that these patterns may he controlled by thermodynamic properties of the individual PCDD/F congeners, such as the free Gibbs energy of formation (Delta G degrees(f, T)) This would make prediction of the isomer composition of a particular sample (and hence its TEQ value) possible, based on values of Delta G degrees(f.T). A laboratory scale study was carried out with activated carbon on fly ash as the source of PCDD/F formation. Although it was found that the isomer distributions within homologues were independent of the reaction time (proof of thermodynamic control), other observations (lack of equilibrium/isomerization between isomers and lack of similarity between isomer distributions measured and predicted by Delta G degrees(f, T)) contradicted the possibility of thermodynamic control. Hence, this study could not confirm that De Novo formation of PCDD/F could explain thermodynamically controlled isomer distributions in incinerators. Some recommendations for further work-time-based studies with precursors, isomerization studies with single congeners, and more data on Delta G degrees(f, T) values of PCDD/F-were made.

Keywords: Chlorinated Benzenes, Waste Incinerators, Aromatic-Compounds, Para-Dioxins, Phenols, Carbon, Heats

Devlin, J.F., Klausen, J. and Schwarzenbach, R.P. (1998), Kinetics of nitroaromatic reduction on granular iron in recirculating batch experiments. *Environmental Science & Technology*, **32** (13), 1941-1947.

Full Text: [E\Env Sci Tec32, 1941.pdf](E/Env%20Sci%20Tec32,%201941.pdf)

Abstract: Granular iron has been determined to be a potentially useful reductant for the removal of common organic contaminants from groundwater. This research is aimed at improving our understanding of the processes that control the reactivity and longevity of the iron particles when they are used for groundwater treatment. A suite of nitroaromatic compounds (NACs) including 4-chloronitrobenzene (4CINB), 4-acetylnitrobenzene (4AcNB), nitrobenzene, 2-methylnitrobenzene (2MeNB), and 2,4,6-trinitrotoluene (TNT) was used to investigate granular iron reactivity in anoxic pH 10, 0.008 M KNO3 solution. Master Builder’s brand of granular iron with a surface area of about 1 m2/g was used in all experiments. The NACs were reduced rapidly to anilines that were found to sorb reasonably strongly to the solid particles and to interfere with the reduction of NACs. The granular iron was found to lose reactivity quite rapidly over the first few days of exposure and then more slowly over the next several months. Reactivity loss due to reversibly sorbed products was minimized by flushing the system with background electrolyte between experiments. Competition experiments with binary mixtures of 4CINB and each one of the other NACs were performed to investigate relative affinities of these compounds for the solid surface. Despite the overall loss in reactivity observed for the granular iron, the relative rare constants in the competition experiments appeared to remain constant in time.

Keywords: Zero-Valent Iron, Substituted Nitrobenzenes, Metal, Degradation, Adsorption

? Sullivan, E.J., Hunter, D.B. and Bowman, R.S. (1998), Fourier transform Raman spectroscopy of sorbed HDTMA and the mechanism of chromate sorption to surfactant-modified clinoptilolite. *Environmental Science & Technology*, **32** (13), 1948-1955.

Full Text: [1998\Env Sci Tec32, 1948.pdf](1998/Env%20Sci%20Tec32,%201948.pdf)

Abstract: We examined sorption of the cationic surfactant hexadecyltrimethylammonium bromide (HDTMA) to clinoptilolite zeolite and the subsequent sorption of the chromate anion to surfactant-modified zeolite (SMZ). We used Fourier transform (FT) Raman spectroscopy and batch sorption methods to elucidate the structure of sorbed HDTMA and to determine the mechanisms of chromate sorption. At high HDTMA loading levels (above the zeolite’s external cation exchange capacity, ECEC), the Raman spectra indicated th at sorbed HDTMA was similar in conformation to solution micelles and, thus, may contain anion exchange sites. Sorbed HDTMA showed less structuring of tail groups and a decrease in head group hydration. At lower loadings, the sorbed HDTMA tail groups tended to have more disorder, similar to solution monomers. When HDTMA loading rates were greater than 100% of the ECEC, chromate sorbed onto SMZ with near-equivalent Br- counterion exchange. A peak in the Raman spectrum at 902 cm-1 indicated the presence of sorbed Cr2O72-, although no bulk solution oligomerized chromate species should have been present at a solution pH of 7. A 30 cm-1 shift in the nu(1) peak for sorbed versus solution chromate may indicate that surface-enhanced Lewis acid-base interactions were responsible for some chromate sorption in addition to the predominant anion-exchange mechanism.

Keywords: Adsorption, Capacity, Cation Exchange Capacity, Cationic Surfactant, Chromate, Colloidal Silver, Hdtma, Hexadecyltrimethylammonium, Interactions, Ions, Kinetics, Loading, Mechanism, Mechanisms, Molybdate, pH, Raman Spectroscopy, Scattering, Silica, Sites, Sorbed, Sorption, Spectra, Spectroscopy, Structure, Surfactant, Tungstate, Zeolite

? Li, Z.H. and Bowman, R.S. (1998), Sorption of perchloroethylene by surfactant-modified zeolite as controlled by surfactant loading. *Environmental Science & Technology*, **32** (15), 2278-2282.

Full Text: [1998\Env Sci Tec32, 2278.pdf](1998/Env%20Sci%20Tec32,%202278.pdf)

Abstract: The sorption of nonpolar hydrophobic organic compounds by soil organic matter has long been attributed to a partitioning mechanism, with the sorption coefficient proportional to the fractional organic carbon content of the soil. However, deviations from this linear proportionality have been observed and reported in the literature by many authors. In our study a natural zeolite was modified with a cationic surfactant to achieve different fractional organic carbon contents and different surfactant molecule configurations on the surface. The sorption of perchloroethylene (PCE) by the surfactant-modified zeolite (SMZ) was found to be dependent on the bound surfactant molecule configuration as well as on the fractional organic carbon content. Below monolayer coverage by the surfactant, the PCE sorption coefficient on SMZ was proportional to the fractional organic carbon content. Above monolayer coverage, increasing fractional organic carbon content resulted in minimal further increase in the PCE sorption coefficient. The change in PCE sorption behavior was attributed to the structural differences between sorbed surfactant monolayers and bilayers. The surfactant surface configuration has a significant impact on the effective volume and density of the bound organic phase that is responsible for partitioning nonpolar organic compounds. The ratio of the organic carbon-based distribution coefficient (K-OC) for the monolayer versus that for the bilayer systems was 1.7, similar to the estimated bilayer to monolayer hydrocarbon density of 1.3. Our results reinforce the notion that the structure of natural organic matter as well as its quantity controls the sorption of nonpolar organics to soils and sediments.

Keywords: Adsorbed Layer, Adsorption, Behavior, Carbon, Carbon Content, Cationic Surfactant, Cations, Density, Distribution, Distribution Coefficient, Equilibria, Hydrocarbon, Hydrophobic Organic Compounds, Impact, Ionic Organic-Compounds, K-Oc, Koc, Loading, Matter, Mechanism, Natural, Natural Organic Matter, Nonionic Surfactants, Organic, Organic Carbon, Organic Compounds, Organic Matter, Organics, Partitioning, Quantity, Sediments, Silica Water Interface, Soil, Soil Organic Matter, Soils, Solubilization, Sorbed, Sorption, Structure, Surfactant, Surfactant Loading, Zeolite

Warren, L.A. and Ferris, F.G. (1998), Continuum between sorption and precipitation of Fe(III) on microbial surfaces. *Environmental Science & Technology*, **32** (15), 2331-2337.

Full Text: [E\Env Sci Tec32, 2331.pdf](E/Env%20Sci%20Tec32,%202331.pdf)

Abstract: Bacteria are a widespread, abundant, geochemically reactive component of aquatic environments. However, their role in the formation of secondary reactive surface phases such as iron oxides or in the direct sorption of metal contaminants has yet to be quantitatively described. Here, we compare the formation of iron oxides on bacterial cell surfaces to their formation abiotically (no bacteria present) over a range of both Fe(III) concentration (10-2 - 10-4.5 M) and pH (2-4.5) in the laboratory. Iron sorption and subsequent precipitation reactions at bacterial surfaces were modeled using current geochemical approaches. Solid-phase partitioning of Fe(III) as hydrous ferric oxide (HFO) was enhanced in the presence of a variety of bacteria over that seen in abiotic controls. The onset of HFO formation occurred at lower pH values and in greater quantities at any given pH in the bacterial treatments. Fe(III) reactions at bacterial surfaces follow a clear continuum between sorption and precipitation that can be quantitatively described using geochemical principles and modeled using surface precipitation theory, to date only demonstrated for inorganic surfaces. These results show that the reactions at biological surfaces are likely to be important in determining the spatial distribution of iron oxides in nature and thus the reactive transport of metals in aqueous environments.

Keywords: Heavy-Metals, Microorganisms, Environments, Bacteria, Calcite, Canada, Model, Iron

Wagrowski, D.M. and Hites, R.A. (1998), Partitioning of polychlorinated dibenzo-*p*-dioxins and dibenzofurans between the atmosphere and corn. *Environmental Science & Technology*, **32** (16), 2389-2393.

Full Text: [E\Env Sci Tec32, 2389.pdf](E/Env%20Sci%20Tec32,%202389.pdf)

Abstract: Polychlorinated dibenzo-p-dioxins (PCDD) and polychlorinated dibenzofurans (PCDF) are lipophilic atmospheric contaminants that accumulate in vegetation, a process which may lead to the contamination of food. Thus, knowledge of PCDD/F accumulation in vegetation is crucial to evaluating human exposure, in an effort to determine this accumulation mechanism, we analyzed matched atmosphere, corn kernel, and corn leaf samples from a private farm in Felicity, OH. Corn is an important feed crop in the United States, both corn kernels and corn leaves (silage) a re widely used. PCDD/F concentrations were bel ow the detection limits (0.5-1 pg/g lipids) in the corn kernels. However, we found PCDD/F concentrations of 510±75 fg/m3, 1300±300 fg/m3, and 4.2±1.2 ng/g lipids in the atmospheric gas phase, atmospheric particle phase, and corn leaves, respectively. For each set of air and corn leaf samples, we calculated corn leaf-atmosphere partition coefficients for both the atmospheric gas and particle phases, K-v, K-g and K-v, K-p respectively. On the basis of plots of the natural logarithm of these partition coefficients versus the reciprocal of the average, atmospheric temperature, we conclude that the partitioning of PCDD/F between the atmosphere and corn leaves is dependent on temperature. We calculated the enthalpies of phase change between the vegetation and air for all PCDD/F homologues, our values are comparable to literature values for polycyclic aromatic hydrocarbons and polychlorinated biphenyls. The ratio of K-v, K-p to K-v, K-g is a log-log function of the average vapor pressure for each PCDD/F homologue, indicating that vapor pressure plays an important role in the partitioning of both the gas and particle phases to corn leaves.

Keywords: Polycyclic Aromatic-Hydrocarbons, United-States Beef, Chlorinated Dioxins, Food-Chain, PCDD PCDF, Soils, Vegetation, Furans, Grass, Validation

Zhao, J.C., Wu, T.X., Wu, K.Q., Oikawa, K., Hidaka, H. and Serpone, N. (1998), Photoassisted degradation of dye pollutants 3. Degradation of the cationic dye Rhodamine B in aqueous anionic surfactant/TiO2 dispersions under visible light irradiation: Evidence for the need of substrate adsorption on TiO2 particles. *Environmental Science & Technology*, **32** (16), 2394-2400.

Full Text: [E\Env Sci Tec32, 2394.pdf](E/Env%20Sci%20Tec32,%202394.pdf)

Abstract: The TiO2 photoassisted degradation of the cationic dye Rhodamine B (RhB) has been examined in aqueous dispersions under visible light irradiation at wavelengths longer than 470 nm in the presence and absence of the anionic surfactant sodium dodecylbenzenesulfonate (DBS). RhB degrades slowly via a pH-independent process in TiO2 dispersions containing no DBS. The surfactant DBS adsorbs strongly on the TiO2 particles and significantly accelerates RhB degradation with initial rates reaching maximal values at the critical micelle concentration of DBS (cmc = 1.2 mM). In the presence of DBS, rates decrease with increase in pH, an effect directly attributable to variations in the extent of adsorption of RhB with changes in the surface charge of TiO2 particles. The zeta (zeta)-potentials of TiO2 particles in RhB/DBS/TiO2 dispersions (pH 2.1) show that DBS significantly enhances RhB adsorption and correlates with an enhancement in the rate of photodegradation of RhB. The results confirm the heretofore presumed but valid notion that preadsorption on the surface of TiO2 particles is prerequisite for efficient photodegradation of RhB under visible light irradiation, moreover, the data infer that degradation occurs at the particle surface and not in the solution bulk. Present observations are consistent with a pathway in which excited RhB\* injects an electron onto TiO2 (an electron-transfer mediator) that is subsequently scavenged by O-2 to form the O-2 (-) radical anion and ultimately the OH radical, as evidenced by DMPO spin-trapping ESR experiments carried out under conditions otherwise similar to those in photodegradation which, we infer, participates in the RhB photodegradation.

Keywords: Photocatalytic Degradation, Titanium-Dioxide, Environmental Photochemistry, Semiconductor Surfaces, Electron-Transfer, Photodegradation, Identification, Photooxidation, Suspensions, Superoxide

Leenheer, J.A., Brown, G.K., MacCarthy, P. and Cabaniss, S.E. (1998), Models of metal binding structures in fulvic acid from the Suwannee River, Georgia. *Environmental Science & Technology*, **32** (16), 2410-2416.

Full Text: [E\Env Sci Tec32, 2410.pdf](E/Env%20Sci%20Tec32,%202410.pdf)

Abstract: Fulvic acid, isolated from the Suwannee River, Georgia, was assessed for its abilityto bind Ca2+, Cd2+, Cu2+, Ni2+, and Zn2+ ions at pH 6 before and after extensivefractionation that was designed to reveal the nature of metal binding functionalgroups, The binding constant for Ca2+ ion had the greatest increase of all the ionsin a metal binding fraction that was selected for intensive characterization for thepurpose of building quantitative average model structures. The “metal binding”fraction was characterized by quantitative 13C NMR, 1H NMR, and FT-IRspectrometry and elemental, titrimetric, and molecular weight determinations. Thecharacterization data revealed that carboxyl groups were clustered in short-chainaliphatic dibasic acid structures. The Ca2+ binding data suggested thatether-substituted oxysuccinic acid structures are good models for the metal bindingsites at pH 6. Structural models were derived based upon oxidation and photolyticrearrangements of cutin, lignin, and tannin precursors. These structural models richin substituted dibasic acid structures revealed polydentate binding sites with thepotential for both inner-sphere and outer-sphere type binding. The majority of thefulvic acid molecule was involved with metal binding rather than a small substructuralunit.

Keywords: Carboxyl-Group Structures, Humic Substances, Chemistry

Notes: highly cited

? Jobling, S., Nolan, M., Tyler, C.R., Brighty, G. and Sumpter, J.P. (1998), Widespread sexual disruption in wild fish. *Environmental Science & Technology*, **32** (17), 2498-2506.

Full Text: [1998\Env Sci Tec32, 2519.pdf](1998/Env%20Sci%20Tec32,%202519.pdf)

Abstract: A number of chemicals present in the environment have been shown to mimic or antagonize the actions of steroid hormones, an issue often described as “endocrine disruption/modulation”. There is very little evidence, however, to support the hypothesis that exposure to endocrine-disrupting chemicals is a global environmental health problem. In this paper, we demonstrate a high incidence of intersexuality in wild populations of riverine fish (roach; Rutilus rutilus) throughout the United Kingdom. These reproductive disturbances are consistent with exposure to hormonally active substances and a re associated with discharges from sewage treatment works that are known to contain estrogenic chemicals. This is the first documented example of a widespread sexual disruption in wild populations of any vertebrate and indicates that reproductive and developmental effects do result from exposure to ambient levels of chemicals present in typical British rivers.

Document Type: Article

Language: English

KeyWords Plus: TROUT ONCORHYNCHUS-MYKISS; ESTROGENIC ACTIVITY; CYPRINUS-CARPIO; TESTOSTERONE CONCENTRATIONS; ORYZIAS-LATIPES; RAINBOW-TROUT; VITELLOGENIN; CHEMICALS; INDUCTION; ALKYLPHENOLS

Robertson, A.P. and Leckie, J.O. (1998), Acid/base, copper binding, and Cu2+/H+ exchange properties of goethite, an experimental and modeling study. *Environmental Science & Technology*, **32** (17), 2519-2530.

Full Text: [E\Env Sci Tec32, 2519.pdf](E/Env%20Sci%20Tec32,%202519.pdf)

Abstract: For aquatic systems, the movement, fate, and impact of trace metals strongly depend on the metal’s tendency to partition to surfaces. An experimental and modeling study of proton and copper(II) sorption and Cu2+/H+ exchange to goethite (alpha-FeOOH), an important oxide mineral, was conducted. Copper partitioning data covered three pHs, two ionic strengths, three orders of magnitude in copper surface coverage, and six orders of magnitude in solution copper(II) activity. Three surface complexation models [diffuse layer model (DLM), triple-layer model (TLM), and modified triple-layer model (Mod TL)I successfully replicated copper partitioning when at least two classes of copper binding sites, differing significantly in copper binding affinity, were included in the analysis. The (combination of) surface complex(es) that fit the data well depends on the model employed. Fits to the copper partitioning data do not permit selection of a “best” model/complex(es) combination. However, only the TLM and Mod TL reasonably replicate the proton partitioning (acid/base) properties of the goethite.

Keywords: Surface Complexation Models, Solid-Solution Interface, Humic Substances, Aqueous-Solution, Water Interface, Ion Adsorption, Oxide, Sorption, Precipitation, (Hydr)Oxides

Strawn, D.G., Scheidegger, A.M. and Sparks, D.L. (1998), Kinetics and mechanisms of Pb(II) sorption and desorption at the aluminum oxide water interface. *Environmental Science & Technology*, **32** (17), 2596-2601.

Full Text: [E\Env Sci Tec32, 2596.pdf](E/Env%20Sci%20Tec32,%202596.pdf)

Abstract: The fate of Pb in the environment is highly dependent on sorption and desorption reactions on solid surfaces. In this study Pb sorption and desorption kinetics on gamma-Al2O3 at pH 6.50, I = 0.1 M, and [Pb](initial) = 2 mM were investigated using both macroscopic and spectroscopic measurements. X-ray absorption fine structure (XAFS) spectroscopy revealed a Pb-Al bond distance of 3.40 Angstrom, consistent with an inner-sphere bidentate bonding mechanism. XAFS results show no change with time in the average local atomic structure surrounding the Pb and no indication of the formation of Pb surface precipitates. Adsorption kinetics were initially fast, resulting in 76% of the total sorption occurring within 15 min, followed by a slow continuous sorption reaction likely resulting from diffusion through micropores. Desorption at I = 0.1 M and pH 6.50 was studied using a cation-exchange resin as a sink for Pb(aq). Under these conditions, Pb desorption was 98% reversible within 3 days of incubation time. Furthermore, desorption and adsorption kinetics demonstrated similar trends: a fast reaction followed by a slow reaction. The use of spectroscopy combined with adsorption and desorption kinetic studies has revealed important information on the interaction between lead and aluminum (hydr)oxides. This information is valuable for predicting the fate of Pb in the environment.

Keywords: X-Ray-Absorption, Amorphous Iron Oxyhydroxide, Bond-Valence Determination, Selenite Adsorption, Surface-Chemistry, Spectroscopy, Complexes, Lead, Cadmium, Ferrihydrite

Notes: highly cited

Kratochvil, D., Pimentel, P. and Volesky, B. (1998), Removal of trivalent and hexavalent chromium by seaweed biosorbent. *Environmental Science & Technology*, **32** (18), 2693-2698.

Full Text: [E\Env Sci Tec32, 2693.pdf](E/Env%20Sci%20Tec32,%202693.pdf)

Abstract: Protonated or Ca-form *Sargassum* seaweed biomass bound up to 40 mg/g of Cr(III) by ion exchange at pH 4. An ion-exchange model assuming that the only species taken up by the biomass was Cr(OH)2+ successfully fitted the experimental biosorption data for Cr(III). The maximum uptake of Cr(VI) by protonated *Sargassum* biomass at pH 2 was explained by simultaneous anion exchange and Cr(VI) to Cr(III) reduction. At pH <2.0, the reduction of Cr(VI) to Cr(III) dominated the equilibrium behavior of the batch systems, which was explained by the dependence of the reduction potential of HCrI4-ions on the pH. At pH >2.0, the removal of Cr(VI) was linked to the depletion of protons in equilibrium batch systems via an anion-exchange reaction. The optimum pH for Cr(VI) removal by sorption lies in the region where the two mechanisms overlap, which for *Sargassum* biomass is in the vicinity of pH 2. The existence of the optimum pH for the removal of Cr(VI) may be explained by taking into account (a) the desorption of Cr(III)from biomass at low pH and (b)the effect of pH on the reduction potential of Cr(VI) in aqueous solutions. Seventy percent of Cr(VI) bound to the seaweed at pH 2 can be desorbed with 0.2 M H2SO4 via reduction to Cr(III).

Keywords: Metal Ion-Exchange, Heavy-Metals, Biosorption, Adsorption, Copper(II), Biomass, Cu

Korshin, G.V., Frenkel, A.I. and Stern, E.A. (1998), EXAFS study of the inner shell structure in copper(II) complexes with humic substances. *Environmental Science & Technology*, **32** (18), 2699-2705.

Full Text: [E\Env Sci Tec32, 2699.pdf](E/Env%20Sci%20Tec32,%202699.pdf)

Abstract: The structure of humic substances (HS) and their complexes with metal cations is a matter of ongoing debate. In this paper, the structure of Cu2+-HS complexes was studied by extended X-ray absorption fine structure spectroscopy (EXAFS). This method is highly sensitive to the local structure around the target (e.g., Cu2+ or other cations). The CuO6 octahedron was used to model the inner complexation shell of the Cu2+-HS complexes. The quality of the fit of the EXAFS data was tested using model systems (copper(II)-aqua and -salicylate complexes). On the basis of the dissimilarity of the EXAFS spectra for the Cu2+-tetrahydrofurantetracarboxylic acid complex from those of the Cu2+-HS complexes, it is concluded that complexation sites of HS are not likely to contain carboxylic groups attached to a furan ring. The Cu-O distances in ail Cu2+-HS complexes were shorter than those in aqua or salicylate complexes. The contraction of the Cu-O distance was especially prominent for the axial direction, and the distortion of the inner shell was much reduced. The mean-square disorder values for the axial Cu-O pairs in Cu2+-HS complexes indicate that the axial oxygens are more tightly bound with the central cation than those in either aqua or salicylic complexes, possibly indicating six-dentate coordination of Cu2+ by HS.

Keywords: X-Ray-Absorption, Dissolved Organic-Matter, Edge Structure Xanes, Fine-Structure, Aqueous-Solution, Natural-Waters, Binding-Sites, Fulvic-Acids, Suwannee River, Iron-Oxide

Mercier, L. and Pinnavaia, T.J. (1998), Heavy metal lan adsorbents formed by the grafting of a thiol functionality to mesoporous silica molecular sieves: Factors affecting Hg(II) uptake. *Environmental Science & Technology*, **32** (18), 2749-2754.

Full Text: [E\Env Sci Tec32, 2749.pdf](E/Env%20Sci%20Tec32,%202749.pdf)

Abstract: A new approach to heavy metal ion adsorbents based on the covalent grafting of 3-mercaptopropylsilyl groups to the framework pore walls of mesoporous silica molecular sieves has been investigated with regard to hydroxyl group densities, channel dimensions, and morphologies. Two types of silicas were examined, namely, MCM-41 with an initially anionic silicate framework and HMS with an electrically neutral framework. The MCM-41 derivative was obtained through electrostatic S+X-I+ assembly, where S+ was a quaternary ammonium ion surfactant, X- was a halide, and If was the silica precursor derived from tetraethyl orthosilicate (TEOS) in acidic solution. HMS silicas were assembled by a S degrees I degrees pathway using alkylamines as surfactants (S degrees) and TEOS as the neutral silica source (I degrees). Prior to thiol functionalization of the mesostructures by a one-step grafting procedure, S+ was removed from MCM-41 by calcination, whereas for HMS, S degrees was removed by solvent extraction. The grafting process was much more effective for the functionalization of HMS than for MCM-41 owing to a higher surface concentration of surface hydroxyl groups. Consequently, the functionalized HMS derivative was able to bind quantitatively more Hg(II) ions from aqueous solution compared to MCM-41. The Hg(II) adsorption capacities for HMS were interpreted in terms of the size and accessibility of the framework pore structure.

Keywords: Pre-Concentration, Trace-Metals, Gel Surface, Adsorption, Ions, Preconcentration, Supports, Mcm-41, Montmorillonite, Extraction

Sposito, G. (1998), On points of zero charge. *Environmental Science & Technology*, **32** (19), 2815-2819.

Full Text: [E\Env Sci Tec32, 2819.pdf](E/Env%20Sci%20Tec32,%202819.pdf)

Abstract: Following on the pioneering efforts of Werner Stumm and his collaborators, environmental che mists have developed increasingly detailed molecular models of the adsorbent aqueous solution interface in order to quantify the pH dependence of surface charge. This model development. irrespective of its level of sophistication, is subject to a few broad constraints, which may be termed generic properties of surface charge, that in turn reflect certain macroscopic conditions imposed by electroneutrality and thermodynamic stability. In this paper, rigorous proofs of these generic properties are given, and the results are used to establish general connections among conventional points of zero charge that all molecular models of the electrical double layer must respect. The nonunique relationship between a molecular model of the electrical double layer and the observed effects of ion adsorption on points of zero charge is emphasized.

Keywords: Surface-Charge, Adsorption, Oxides, Systems, Water, Complexation, Interfaces, Prediction, Stability, Pb(II)

Au, K.K., Yang, S.L. and O’Melia, C.R. (1998), Adsorption of weak polyelectrolytes on metal oxide surfaces: A hybrid SC/SF approach. *Environmental Science & Technology*, **32** (19), 2900-2908.

Full Text: [E\Env Sci Tec32, 2900.pdf](E/Env%20Sci%20Tec32,%202900.pdf)

Abstract: A hybrid SC/SF model to describe the adsorption of weak polyelectrolytes on metal oxide surfaces is presented. This model couples the surface complexation (SC) model for the effects of surface and solute speciation on the adsorption of monomers on oxides with the Scheutjens-Fleer (SF) model for the effects of macromolecular properties on the adsorption of polymers and polyelectrolytes on surfaces. The average magnitude of the specific interactions between polyelectrolyte functional groups and surface sites, expressed by the parameter chi (s) (hyb), varies systematically with surface and polyelectrolyte speciation and hence with solution chemistry. Measurements of the adsorption of polygalacturonic acid (PGUA) on hematite over wide ranges of pH and ionic strength are used to test the hybrid model. Good agreement of model simulations and adsorption measurements is achieved. A reaction represented by >MeOH + L- = >MeOHL- provides the best representation of the experimental data.

Klewicki, J.K. and Morgan, J.J. (1998), Kinetic behavior of Mn(III) complexes of pyrophosphate, EDTA, and citrate. *Environmental Science & Technology*, **32** (19), 2916-2922.

Full Text: [E\Env Sci Tec32, 2916.pdf](E/Env%20Sci%20Tec32,%202916.pdf)

Abstract: Aqueous complexes of Mn3+ ion with the ligands pyrophosphate (P2O74-), EDTA (C10H12O8N24-, ethylenediaminotetraacetate(4-)), or citrate (CIT3-, C6H5O73-) were prepared rapidly in solution by the general reaction: Mn(VII) + 4Mn(II)L + L--> 5Mn(III)L, where L is the ligand (in known excess). Different initial pH values of the complex solutions were obtained by prior addition of required acid, base, or buffer. Disappearance of Mn(lll)L complex with time was monitored by light absorbance at appropriate wavelengths. Rates of loss for each Mn(lll)L complex are found to depend on pH and the ratio [ligand](T)/ [Mn](T). Relative chemical time scales for Mn(lll)L disappearance at neutral pH and similar ligand-to-metal ratios were manganese(III) pyrophosphate > manganese(III) citrate >> manganese(lll) EDTA. The kinetic observations are interpreted as reflecting ligand hydrolysis and disproportionation in the case of pyrophosphate (a nonredox active compound), inner-sphere electron transfer from citrate to Mn3+, and both outer-sphere and intramolecular electron transfer from EDTA to Mn3+. In the presence of O2, manganese(II) citrate complex is reoxidized to manganese(III) citrate. The results suggest a potential for formation of Mn(III) complexes with ligands in great excess and kinetic stabilization under certain natural water conditions (e.g., where pronounced redox gradients are present or where appreciable concentrations of superoxide, peroxide, and hydroxyl radical are produced). Similar Mn(III) behavior to that reported here might be anticipated for other ligands such as catechol and humic matter in natural waters.

Keywords: Manganese, Oxidation

Sunda, W.G. and Huntsman, S.A. (1998), Control of Cd concentrations in a coastal diatom by interactions among free ionic Cd, Zn, and Mn in seawater. *Environmental Science & Technology*, **32** (19), 2961-2968.

Full Text: [E\Env Sci Tec32, 2961.pdf](E/Env%20Sci%20Tec32,%202961.pdf)

Abstract: Cadmium and phosphate concentrations in seawater are closely correlated, suggesting that Cd distributions, like those of PO4, are controlled by algal uptake and regeneration. But the factors controlling Cd levels in phytoplankton are poorly known. Experiments in metal ion buffer systems with a coastal diatom Thalassiosira pseudonana revealed that cellular Cd: C ratios within the Cd ion concentration ([Cd2+]) range (10-13 to 10-10 M) in, seawater were generally proportional to [Cd2+] and inversely related to concentrations of Zn and Mn ions ([Zn2+] and [Mn2+]) and specific growth rate. The effects of Mn and Zn reflect cellular uptake of Cd by two inducible transport systems: the Mn system whose capacity (V-max) is enhanced at low [Mn2+] and a separate system induced at low cellular zinc. At the low [Zn2+] of surface oceanic waters (less than or equal to 10-11.0 M), Cd uptake is controlled by this latter system and, therefore, is inversely related to ionic zinc levels. However, at the higher [Zn2+] range of coastal waters, Cd uptake by this system is strongly suppressed and Cd instead is taken up by the Mn system, as a result it is inversely related to [Mn2+] and largely independent of variations in [Zn2+]. Because of the suppression of Cd uptake by high [Zn2+] and [Mn2+] in coastal waters, algal Cd concentrations may be lower in these waters than in the ocean despite the presence of higher coastal [Cd2+].

Keywords: Natural Organic-Ligands, Central North Pacific, Marine-Phytoplankton, Phytochelatin Production, Sargasso Sea, Cadmium, Zinc, Limitation, Manganese, Transport

Ruokojärvi, P.H., Halonen, I.A., Tuppurainen, K.A., Tarhanen, J. and Ruuskanen, J. (1998), Effect of gaseous inhibitors on PCDD/F formation. *Environmental Science & Technology*, **32** (20), 3099-3103.

Full Text: [E\Env Sci Tec32, 3099.pdf](E/Env%20Sci%20Tec32,%203099.pdf)

Abstract: Emissions of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCD Fs) from municipal waste in cine ration are currently a subject of considerable public concern because of their extreme toxicity. PCDD/F formation in incineration processes is being studied widely, but studies on inhibition are quite sparse, especially in a pilot-plant scale. In this work, the effect of four gaseous inhibitors (sulfur dioxide, ammonia, dimethylamine, and methyl mercaptan) on PCDD/PCDF formation in the combustion of liquid fuel was studied using a pilot-scale plant. The inhibitors were injected into the flue gas stream after the first economizer at a temperature of 670°C and just before the second economizer at 410°C. Both the chlorophenol and PCDD and PCDF concentrations decreased when inhibitors were added. Particle-phase PCDD/F concentrations in particular decreased by up to 98%. The results suggest that the formation of PCDD/Fs is hindered in the particle phase at the early stages of the PCDD/F formation chain, probably even before precursors such as chlorophenols have been formed.

Keywords: Dibenzo-p-Dioxins, Municipal Waste Incinerator, Fly-Ash, Flue-Gas, Organic-Compounds, Electrostatic Precipitator, Polyaromatic Hydrocarbons, Chlorinated Dioxins, Ammonia Injection, PCDF Emissions

Cornelissen, G., van Noort, P.C.M. and Govers, H.A.J. (1998), Mechanism of slow desorption of organic compounds from sediments: A study using model sorbents. *Environmental Science & Technology*, **32** (20), 3124-3131.

Full Text: [E\Env Sci Tec32, 3124.pdf](E/Env%20Sci%20Tec32,%203124.pdf)

Abstract: The desorption kinetics of PCBs and chlorohenzenes have been studied at 5, 20, and 60°C for model sorbents in which either micropore diffusion (zeolite, montmorillonite, and XAD-8) or organic matrix diffusion/entrapment (rubbery polyacetal and glassy polystyrene) could occur. Also, a sediment was studied whose organic matter (OM) had been completely removed. All sorbents exhibited slow desorption (rate constants (1-5×10-3 h-1). The sediment without OM showed significantly smaller slowly desorbing fractions (factor 3-8) than the original sediment (about 6% OM). Sorbent-water distribution ratios of the mi cro porous sorbents and the sediment without OM were 10-100 times lower than the ones of the original sediment. So, although the presence of both mineral micropores and/or OM can result in slow desorption behavior of organic compounds from soils and sediments, OM is more important for slow desorption than mineral micropores in sediments with more than about 0.1-0.5% OM. The sorption and desorption parameters measured for the sorbents were compared to the ones measured for sediment. This analysis showed that the observations for XAD-8 tin which slow desorption is assumed to be caused by slow diffusion along hydrophobic pore walls) were most similar to the ones for the sediment, indicating that diffusion through pores in the organic matter or pores coated with organic material play roles in slow desorption.

Keywords: Distributed Reactivity Model, Sorption Kinetics, Soils, Chemicals, Diffusion, Temperature, Adsorption, Naphthalene, Domains, Time

Ravichandran, M., Aiken, G.R., Reddy, M.M. and Ryan, J.N. (1998), Enhanced dissolution of cinnabar (mercuric sulfide) by dissolved organic matterisolated from the Florida Everglades. *Environmental Science & Technology*, **32** (21), 3305-3311.

Full Text: [E\Env Sci Tec32, 3305.pdf](E/Env%20Sci%20Tec32,%203305.pdf)

Abstract: Organic matter isolated from the Florida Everglades caused a dramatic increase inmercury release (up to 35 µM total dissolved mercury) from cinnabar (HgS), asolid with limited solubility. Hydrophobic (a mixture of both humic and fulvic) acidsdissolved more mercury than hydrophilic acids and other nonacid fractions ofdissolved organic matter (DOM). Cinnabar dissolution by isolated organic matter *and* natural water samples was inhibited by cations such as Ca2+. Dissolution wasindependent of oxygen content in experimental solutions. Dissolution experimentsconducted in DI water (pH = 6.0) had no detectable (<2.5 nM) dissolved mercury.The presence of various inorganic (chloride, sulfate, or sulfide) and organic ligands *(*salicylic acid, acetic acid, EDTA, or cysteine) did not enhance the dissolution ofmercury from the mineral. Aromatic carbon content in the isolates (determined byC-13 NMR) correlated positively with enhanced cinnabar dissolution. zeta-potentialmeasurements indicated sorption of negatively charged organic matter to thenegatively charged cinnabar (pH (pzc) = 4.0) at pH 6.0. Possible mechanisms ofdissolution include surface complexation of mercury and oxidation of surface sulfurspecies by the organic matter.

Keywords: Humic Substances, Fulvic-Acid, Waters, Mobilization, Reduction, System, Pyrite, Sulfur, Soils, Iron

Addink, R., Espourteille, F. and Altwicker, E.R. (1998), Role of inorganic chlorine in the formation of polychlorinated dibenzo-*p*-dioxins/dibenzofurans from residual carbon on incinerator fly ash. *Environmental Science & Technology*, **32** (21), 3356-3359.

Full Text: [E\Env Sci Tec32, 3356.pdf](E/Env%20Sci%20Tec32,%203356.pdf)

Abstract: NaCl was added to a solid waste incinerator Sly ash to study its role in the formation of polychlorinated dibenzo-p-dioxins (PCDD) and dibenzofurans (PCDF). Parameters that varied were as follows: chloride concentration, oxygen concentration, temperature, and time. None of these reaction conditions resulted in an increase in PCDD/F formation, compared to undoped ash. An essentially zero-order behavior was observed for NaCl. When added to aqueous extracted ash, from which the soluble inorganic chloride had been removed before the addition, formation rates increased, with an optimum for [Cl-] = 0.4 mmol/g (1.5 wt %). These results suggested that NaCl acted only as a chlorinating reagent on fly ash when no other chlorine sources were available. Surprisingly, only PCDF was formed on the aqueous extracted ash after addition of NaCl. Apparently, the PCDD formation catalyst had been removed by the water.

Keywords: Dioxins

Bremle, G. and Larsson, P. (1998), PCB concentration in fish in a river system after remediation of contaminated sediment. *Environmental Science & Technology*, **32** (22), 3491-3495.

Full Text: [E\Env Sci Tec32, 3491.pdf](E/Env%20Sci%20Tec32,%203491.pdf)

Abstract: An 1991 investigation of PCB concentrations in water and fish along a river was repeated in 1996 after the completion of a remediation of PCB-containing sediment in a lake within the river system. The PCB concentrations in the lake water decreased significantly (from 8.6 to 2.7 ng/L), and the concentrations in fish was halved (significantly lower) after remediation. PCB still remaining in littoral sediment was probably the cause for a recorded gradient of PCB concentrations in fish from the lake and downstream. The PCB concentrations in water and fish was lower in 1996 compared to 1991 in all locations studied. The decreased levels of PCB in fish between the years for the two upstream locations, probably results from a decline in background PCB exposure. Monitoring data from 30 years back, recorded in a south Swedish lake, has shown a 6% decline per year in the PCB concentration in pike (Esox lucius) (Bignert, A., Olsson, M., Persson, W., Jensen, S., Zakrisson, S., Litzen, K., Eriksson, U., Haggberg, L., Alsberg, T. Environ. Pollut. 1998, 94, 177-198). The data on PCB concentration in fish (perch, in the present study) from the two upstream locations were recalculated on the basis of this yearly decline and resulted in concentrations close to those measured in 1996. The results indicated, that changes in background exposure must be taken into account when evaluating the success of remedial actions measures carried out over several years.

Keywords: Organochlorine Compounds, Concentration Trends, Lake-Ontario, Pollutants, Population, Congeners, Sweden, Water

Bergen, B.J., Rahn, K.A. and Nelson, W.G. (1998), Remediation at a marine superfund site: Surficial sediment PCB congener concentration, composition, and redistribution. *Environmental Science & Technology*, **32** (22), 3496-3501.

Full Text: [E\Env Sci Tec32, 3496.pdf](E/Env%20Sci%20Tec32,%203496.pdf)

Abstract: New Bedford Harbor (NBH) is an estuary severely contaminated with polychlorinated biphenyls (PCBs) and is undergoing a multistage Superfund remediation. A longterm monitoring program was developed to assess the effectiveness of this remediation. Seventy-two stations were monitored in the harbor and in adjacent Buzzards Bay. Sediments were collected at each station before and after the initial remedial phase (the “hot spot” removal), and the concentrations of 18 PCB congeners were quantified. A qualitative graphical technique was combined with exploratory statistical techniques to examine the spatial and temporal variability in concentrations of PCBs and proportions of the congeners. The combination of the two techniques with PCB congener ratios revealed subtle changes after remediation that were not evident by a more traditional statistical analysis of total PCB concentrations. Although major redistributions of contaminated sediments were confined to the immediate vicinity of remedial activities, there is evidence that low molecular weight PCBs were transported farther.

Keywords: Bedford

Thomas, G.O., Sweetman, A.J., Lohmann, R. and Jones, K.C. (1998), Derivation and field testing of air-milk and feed-milk transfer factors for PCBs. *Environmental Science & Technology*, **32** (22), 3522-3528.

Full Text: [E\Env Sci Tec32, 3522.pdf](E/Env%20Sci%20Tec32,%203522.pdf)

Abstract: Detailed field experimental data on the air to herbage transfer of PCBs was combined with data on feed to milk transfers from a detailed feeding trial with lactating cows to derive congener-specific air to milk and feed to milk transfer factors (TFA: M and TFF: M) The variability and uncertainties in these factors are discussed largely with reference to UK field conditions. TFA: M values were 2.4, 54, and 650 m3 of air g-1 of milk fat for congeners 18, 74, and 170, respectively. The usefulness of the transfer factors as predictive tools was tested on (i) data from two milk and feed surveys (in late spring 1996 and winter 1997) of farms in Northwest England, (II) data from a long-term monitoring study conducted throughout the 1996 growing season, and (iii) data from the literature. TFA: M and TFF: M gave excellent predictions of the milk PCB concentrations for all tested data sets, with milk concentrations of the persistent congeners predicted to within a factor of similar to 2-3 at the local level and to well within an order of magnitude at the regional level. The main requirements of using TFA: M are that (i) pasture is the dominant feed, (II) winter-fed silage is grown locally, and (iii) there is no local intermittent source. Survey results showed that levels of persistent PCB congeners in silage are directly correlated with milk output fluxes. Bioconcentration factors (BCFs) and carry-over rates (CORs) calculated for both study approaches were very similar to those found in “uncontaminated” feeding studies. Although CORs are theoretically preferable to BCFs the variability found for each showed that there is likely to be little practical advantage in collecting the extra data required for the calculation of CORs.

Keywords: Semivolatile Organic-Compounds, Welsh Ray Grass, UK Urban Air, Polychlorinated-Biphenyls, Cows Milk, Organochlorine Compounds, Pollutants

Huang, W.L. and Weber, Jr., W.J. (1998), A distributed reactivity model for sorption by soils and sediments. 11. Slow concentration-dependent sorption rates. *Environmental Science & Technology*, **32** (22), 3549-3555.

Full Text: [E\Env Sci Tec32, 3549.pdf](E/Env%20Sci%20Tec32,%203549.pdf)

Abstract: Long-term temporal phase distribution relationships (PDRs) were measured for sorption of a hydrophobic organic contaminant probe by seven EPA reference soils and sediments and six shale and kerogen samples. The times required for attainment of apparent sorption equilibrium by the phenanthrene probe were found to be highly dependent upon the aqueous phase-solute concentration, *C*(*t*), for a given sorbent, and the type of soil organic matter (SOM) associated with a particular sorbent. Organic-carbon-normalized single-point temporal distribution ratios corresponding to low residual solution phase concentrations were found to approach their respective apparent equilibrium values after times ranging from several days to 90 days for the EPA soils and sediments and from 90 days to ≥ 368 days for the shales and kerogens. Conversely, at residual solution phase concentrations 2 orders of magnitude larger, apparent equilibrium conditions were attained within a few hours for the EPA soils and sediments and within a year for the shale and kerogen samples. The observed dependencies of sorption rate on *C*(*t*) and on the type of SOM appear to result from differences in solute diffusion behavior within chemically reduced and structurally condensed SOM domains and that in highly amorphous SOM domains. In the former case the very slow and concentration-dependent non-Fickian behavior observed is likely attributable to the slow and energetically driven reconfiguration of local condensed SOM structures to accommodate solute migration into the matrixes. The results of the study extend the applicability of the Dual Reactive Domain Model introduced earlier in this series of papers to the interpretation and description of sorption rate behavior.

van Noort, P.C.M. (1998), Complexity of remediation. *Environmental Science & Technology*, **32** (23), 526A-526A.

? Cancilla, D.A., Martinez, J. and Van Aggelen, G.C. (1998), Detection of aircraft deicing/antiicing fluid additives in a perched water monitoring well at an international airport. *Environmental Science & Technology*, **32** (23), 3834-3835.

Full Text: [1998\Env Sci Tec32, 3834.pdf](1998/Env%20Sci%20Tec32,%203834.pdf)

Abstract: Tolyltriazoles have recently been shown to be the primary agents in aircraft deicing/antiicing fluids (ADAFs) responsible for acute Microtox activity. However, little is known about the fate and effect of these compounds in the environment resulting from airport deicing activities. This research communication describes the first evidence that constituents within ADAFs, other than glycols, are present in subsurface wafer samples from a major North American airport at environmentally significant concentrations. These concentrations are approximately 25 times higher than the reported EC50 values in Microtox assays.

Keywords: Toxicity

Jimenez, B., Hernandez, L.M., Gonzalez, M.J., Eljarrat, E., Rivera, J. and Fossi, M.C. (1998), Congener specific analysis of polychlorinated dibenzo-p-dioxins and dibenzofurans in crabs and sediments from the Venice and Orbetello Lagoons, Italy. *Environmental Science & Technology*, **32** (24), 3853-3861.

Full Text: [E\Env Sci Tec32, 3853.pdf](E/Env%20Sci%20Tec32,%203853.pdf)

Abstract: This study is part of a more extensive research program to characterize pollution in two different lagoons in Italy using a multitrial biomarker approach in combination with residue analysis. It looks at levels of 2,3,7,8-chlorinated PCDDs and PCDFs in crabs and sediments from several locations in the Venice and Orbetello Lagoons, both affected by various types of pollution. The PCDD/F levels found in crabs and sediment from Venice and Orbetello Lagoons varied between sampling sites: the highest being from Porto Marghera harbor, a part of the Venice Lagoon characterized by high industrial impact. Principal Component Analysis was used to identify groups of similar sediment samples which can be correlated to possible sources of contamination. Four different sediment fingerprint patterns were recognized in the two-dimensional space formed by the two principal components which were mainly formed by a combination of highly chlorinated PCDDs and PCDFs.

Keywords: Fresh-Water Fish, Environmental-Samples, Lake-Sediments, PCDDs, PCDFs, Contamination, Photolysis, Pollution, Patterns, Emissions

Baker, J.I. and Hites, R.A. (1999), Polychlorinated dibenzo-p-dioxins and dibenzofurans in the remote North Atlantic marine atmosphere. *Environmental Science & Technology*, **33** (1), 14-20.

Full Text: [E\Env Sci Tec33, 14.pdf](E/Env%20Sci%20Tec33,%2014.pdf)

Abstract: We have developed a sampling strategy that allows us to determine femtogram/cubic meter concentrations of polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans (PCDD/F) in remote marine atmospheres. Using this sampling strategy, a total of 37 air samples were taken during two extended sampling periods at Bermuda between September 1993 and August 1997. During this time, the average total PCDD/F concentrations at Bermuda decreased from 105±30 to 35±10 fg/m3, giving a half-life of about 2 years for these com pounds in the remote marine atmosphere. PCDD/F concentrations during both sampling periods were somewhat higher in the winter when air parcels originated from North America. A second air-sampling station was established at Barbados where 22 air samples were taken between March 1996 and August 1997, an average total PCDD/F concentration at Barbados of 15±7 fg/m3 was found. This value was not significantly different than the 27±7 fg/m3 found at Bermuda during this time when air arrived from the east. This indicated that the remote marine background concentration for these compounds is currently on the order of 20 fg/m3. Using these background concentrations, the dry depositional rate of PCDD/F to the world’s oceans was estimated to he 200±80 kg/year, and the wet depositional rate was estimated to be 900±300 kg/year. This is a total deposition rate of about 1 t/year to the oceans as compared to our previous estimate of 12 t/year PCDD/F deposition from the atmosphere to the land.

Keywords: Chlorinated Dioxins, Bermuda, Incinerators, Furans, Paper, PCDDs, PCDFs, Air, Gas

Ten Hulscher, Th.E.M., Vrind, B.A., van den Heuvel, H., van der Velde, L.E., van Noort, P.C.M., Beurskens, J.E.M. and Govers, H.A.J. (1999), Triphasic desorption of highly resistant chlorobenzenes, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons in field contaminated sediment. *Environmental Science & Technology*, **33** (1), 126-132.

Full Text: [E\Env Sci Tec33, 126.pdf](E/Env%20Sci%20Tec33,%20126.pdf)

Abstract: Pollutants in aged field sediments seem to differ from spiked sediments in their chemical and biological availability. Biphasic desorption is often used as an explanation. In the present study, desorption kinetics and partitioning of chlorobenzenes (CBs), polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs) in long term field contaminated sediment cores and top layer sediment were measured by gas-purging. Desorption from sediment was deduced to be triphasic: fast, slowly, and very slowly desorbing fractions were distinguished. In both the sediment core and the top layer sediment no detectable fast fractions were present for all the compounds studied, so these were estimated as upper limits from the desorption curves. This observation coincided with very high in situ distribution coefficients for several PCBs and PAHs: 10-1000 times higher than literature values for short contact time experiments. Rate constants were (3-8)×10-3 h-1 for slow desorption and (0.16-0.5)×10-3 h-1 for very slow desorption. In some cases only a very slowly desorbing fraction was detectable. Desorption from field contaminated sediments with extended contact times may not be readily estimated from laboratory experiments in which contaminants have contact times with the sediment: in the order of weeks.

Keywords: Temperature-Dependence, Organic-Chemicals, Rhine River, In-Situ, Soil, Sorption, Kinetics, Bioavailability, Adsorption, Water

Tiemann, K.J., Gardea-Torresdey, J.L., Gamez, G., Dokken, K. and Sias, S. (1999), Use of X-ray absorption spectroscopy and esterification to investigate Cr(III) and Ni(II) ligands in alfalfa biomass. *Environmental Science & Technology*, **33** (1), 150-154.

Full Text: [E\Env Sci Tec33, 150.pdf](E/Env%20Sci%20Tec33,%20150.pdf)

Abstract: Previously performed studies have shown that alfalfa shoot biomass can bind an appreciable amount of nickel(II) and chromium(III) ions from aqueous solution. Direct and indirect approaches were applied to study the possible mechanisms involved in metal binding by the alfalfa biomass. The direct approach involves investigations of the metal-bound alfalfa shoot biomass by X-ray absorption spectroscopic analysis (XANES and EXAFS). Results from these studies suggest that nickel(II) and chromium(III) binding mostly occurs through coordination with oxygen ligands. Indirect approaches consist of chemical modification of carboxylate groups that have been shown to play an important role in metal binding to the alfalfa biomass. An appreciable decrease in metal binding resulted after acidic methanol esterification of the biomass, indicating that carboxyl groups are entailed in the metal binding by the alfalfa biomass. In addition, base hydrolysis of the alfalfa biomass increased the binding of these metals, which further indicates that carboxyl groups play an important role in the binding of these metal ions from solution. Therefore, by combining two different techniques, our results indicate that carboxylate groups are the major ligands responsible for the binding of nickel(II) and chromium(III) by alfalfa biomass.

Keywords: Medicago-Sativa Alfalfa, Metal-Ion Binding, Datura-Innoxia, Heavy-Metal, Eu(III) Luminescence, Dissolved Metals, Cd-113 NMR, Copper, Nickel, Adsorption

Alcock, R.E., Jones, K.C., McLachlan, M.S. and Johnston, A.E. (1999), Response to comment on “evidence for the presence of PCDD/Fs in the evironment prior to 1999 and further studies on their temporal trends”. *Environmental Science & Technology*, **33** (1), 206-207.

Full Text: [E\Env Sci Tec33, 206.pdf](E/Env%20Sci%20Tec33,%20206.pdf)

Xia, K., Skyllberg, U.L., Bleam, W.F., Bloom, P.R., Nater, E.A. and Helmke, P.A. (1999), X-ray absorption spectroscopic evidence for the complexation of Hg(II) by reduced sulfur in soil humic substances. *Environmental Science & Technology*, **33** (2), 257-261.

Full Text: [E\Env Sci Tec33, 257.pdf](E/Env%20Sci%20Tec33,%20257.pdf)

Abstract: Analysis of Hg(II) complexed by a soil humic acid (HA) using synchrotron-based X-ray absorption spectroscopy (XAS) revealed the importance of reduced sulfur functional groups (thiol (R-SH) and disulfide (R-SS-R)/disulfane (R-SSH)) in humic substances in the complexation of Hg(II). A two-coordinate binding environment with one oxygen atom and one sulfur atom at distances of 2.02 and 2.38 A, respectively, was found in the first coordination shell of Hg(II) complexed by humic acid. Model calculations show that a second coordination sphere could contain one carbon atom and a second sulfur atom at 2.78 and 2.93 A, respectively. This suggests that in addition to thiol S, disulfide/disulfane S may be involved with the complexation of Hg(II) in soil organic matter. The appearance of carbon atom in the second coordination shell suggests that one O-containing ligand such as carboxyl and phenol ligands rather than H2O molecule is bound to the Hg(II). The involvement of oxygen ligand in addition to the reduced S ligands in the complexation of Hg(II) is due to the low density of reduced S ligands in humic substances. The XAS results from this experiment provided direct molecular level evidence for the preference of reduced S functional groups over oxygen ligands by Hg(II) in the complexation with humic substances.

Keywords: Mercury, Speciation, Adsorption, Binding

Xia, G.S. and Ball, W.P. (1999), Adsorption-partitioning uptake of nine low-polarity organic chemicals on a natural sorbent. *Environmental Science & Technology*, **33** (2), 262-269.

Full Text: [E\Env Sci Tec33, 262.pdf](E/Env%20Sci%20Tec33,%20262.pdf)

Abstract: Sorption of comparatively nonpolar organic chemicals by natural solids not only can be predominated by partitioning with organic matter but also can reflect a substantial contribution from adsorption at low relative concentration. Sorption of nine polycyclic aromatic hydrocarbons (PAHs) and chlorinated benzenes (CBs) was investigated on a subsurface aquitard through batch study, with results interpreted by a composite adsorption-partitioning model. For both PAHs and CBs, the low-concentration adsorption slope and the coefficient for partitioning each correlated well with K-ow, however, PAHs consistently sorbed more strongly than CBs at given K-ow. For all chemicals, adsorption contributions were only important at low relative concentration and could be successfully modeled by assuming either Langmuir-type or Polanyi-type isotherms. Isotherms for all liquid chemicals fell on a single isotherm when plotted on a Polanyi basis (adsorbed volume per mass of sorbent versus adsorption potential density), providing evidence that a pore-filling phenomenon is involved. Adsorbed Volumes of solid chemicals were observed to be less than those of liquids at the same adsorption potential density, consistent with a reduction in packing efficiency and as previously reported for activated carbons. These results suggest that the adsorption contribution is from pore filling within microporous solids.

Keywords: Distributed Reactivity Model, Activated Carbon, Potential-Theory, Water Solution, Hydrophobic Pollutants, Competitive Sorption, Soils, Sediments, Equilibrium, Atrazine

Shokes, T.E. and Möller, G. (1999), Removal of dissolved heavy metals from acid rock drainage using iron metal. *Environmental Science & Technology*, **33** (2), 282-287.

Full Text: [E\Env Sci Tec33, 282.pdf](E/Env%20Sci%20Tec33,%20282.pdf)

Abstract: The chemical and microbial activity of corroding iron metal is examined in the acid rock drainage (ARD) resulting tram pyrite oxidation to determine the effectiveness in neutralizing the ARD and reducing the load of dissolved heavy metals. ARD from Berkeley Pit, MT, is treated with iron in batch reactors and columns containing iron granules. Iron, in acidic solution, hydrolyzes water producing hydride and hydroxide ion resulting in a concomitant increase in pH and decrease in redox potential. The dissolved metals in ARD are removed by several mechanisms. Copper and cadmium cement onto the surface of the iron as zerovalent metals. Hydroxide forming metals such as aluminum, zinc, and nickel form complexes with iron and other metals precipitating from solution as the pH rises. Metalloids such as arsenic and antimony coprecipitate with iron. As metals precipitate from solution, various other mechanisms including coprecipitation, sorption, and ion exchange also enhance removal of metals from solution. Corroding iron also creates a reducing environment supportive for sulfate reducing bacteria (SRB) growth. Increases in SRB populations of 5000-fold are observed in iron metal treated ARD solutions. Although this biological process is slow, sulfidogenesis is an additional pathway to further stabilize heavy metal precipitates.

Keywords: Zero-Valent Iron, Reductive Dehalogenation, Water, Remediation, Groundwater, Particles, Corrosion

? Arey, J.S., Seaman, J.C. and Bertsch, P.M. (1999), Immobilization of uranium in contaminated sediments by hydroxyapatite addition. *Environmental Science & Technology*, **33** (2), 337-342.

Full Text: [1999\Env Sci Tec33, 337.pdf](1999/Env%20Sci%20Tec33,%20337.pdf)

Abstract: Batch equilibrations were performed to investigate the ability of hydroxyapatite (Ca-5(PO4)(3)OH) to chemically immobilize U in two contaminated sediment samples having different organic carbon contents (123 and 49 g kg-1, respectively). Apatite additions lowered aqueous U to near proposed drinking water standards in batch equilibrations of two distinct sediment strata having total U concentrations of 1703 and 2100 mg kg-1, respectively. Apatite addition of 50 g kg-1 reduced the solubility of U to values less than would be expected if autunite (Ca(UO2)(2)(PO4)(2). 10H(2)O) was the controlling solid phase. A comparison of the two sediment types suggests that aqueous phase U may be controlled by both the DOC content through complexation and the equilibrium pH for a given apatite application rate. Sequential chemical extractions demonstrated that apatite amendment transfers U from more chemically labile fractions, including water-soluble, exchangeable, and acid-soluble (pH approximate to 2.55) fractions, to the Mn-occluded fraction (pH approximate to 1.26). This suggests that apatite amendment redirects solid-phase speciation with secondary U phosphates being solubilized due to the lower pH of the Mn-occluded extractant, despite the lack of significant quantities of Mn oxides within these sediments. Energy dispersive X-ray (EDX) analysis conducted in a transmission electron microscope (TEM) confirmed that apatite amendment sequesters some U in secondary Al/Fe phosphate phases.

Keywords: Analysis, Apatite, Aqueous Phase, Carbon, Chemical, Competitive Adsorption, Complexation, Concentrations, Contaminated Sediment, Contaminated Sediments, DOC, Drinking Water, EDX, Equilibrium, Fractions, Hydroxyapatite, Lead, Organic, Organic Carbon, Oxalate, Oxides, Pb, pH, Phosphate, Phosphates, Sediment, Sediments, Soils, Solubility, Speciation, Standards, TEM, Uranium, Water, Waters

? Johnson, A.C., Williams, R.J. and Ulahannan, T. (1999), Comment on “Identification of estrogenic chemicals in STW effluent. 1. Chemical fractionation and in vitro biological screening”. *Environmental Science & Technology*, **33** (2), 369-370.

Full Text: [1999\Env Sci Tec33, 369.pdf](1999/Env%20Sci%20Tec33,%20369.pdf)

? Routledge, E.J., Waldock, M. and Sumpter, J.P. (1999), Response to comment on “Identification of estrogenic chemicals in STW effluent. 1. Chemical fractionation and in vitro biological screening”. *Environmental Science & Technology*, **33** (2), 371.

Full Text: [1999\Env Sci Tec33, 371.pdf](1999/Env%20Sci%20Tec33,%20371.pdf)

Cole, J.G., Mackay, D., Jones, K.C. and Alcock, R.E. (1999), Interpreting, correlating, and predicting the multimedia concentrations of PCDD/Fs in the United Kingdom. *Environmental Science & Technology*, **33** (3), 399-405.

Full Text: [E\Env Sci Tec33, 399.pdf](E/Env%20Sci%20Tec33,%20399.pdf)

Abstract: Reported concentrations of 17 polychlorinated dibenzo-p-dioxin and furan congeners or congener groups in ten environmental media of the U.K. have been compiled. The relative equilibrium status of each congener is deduced with respect to its concentration in urban air which is regarded as the primary source of multimedia contamination. This is accomplished by calculating the equilibrium lipid partitioning (ELP) concentration for each congener and medium using partitioning information derived from measured physical chemical properties. It is shown that the extents of departure from equilibrium conditions between media are consistent for all congeners except the octa-chlorinated compounds. This method of analyzing monitoring data and the consistency of intermedia ELF concentration ratios facilitates the interpretation of the fate and levels of these persistent chemicals in a multimedia environment and yields an approximate predictive capability by which levels in one medium can be used to estimate levels in other media. Benefits of this ELF concentration approach are discussed as a means of enhancing the more complete and detailed interpretation of monitoring data for persistent compounds.

Keywords: Environment, Model

Texier, A.C., Andres, Y. and Le Cloirec, P. (1999), Selective biosorption of lanthanide (La, Eu, Yb) ions by *Pseudomonas aeruginosa*. *Environmental Science & Technology*, **33** (3), 489-495.

Full Text: [E\Env Sci Tec33, 489.pdf](E/Env%20Sci%20Tec33,%20489.pdf)

Abstract: The ability of *Pseudomonas aeruginosa* to adsorb selectively La3+, Eu3+, and Yb3+ from aqueous solution was investigated. The lanthanide biosorption equilibrium obeyed the Brunauer-Emmett-Teller isotherm model, indicating multilayer adsorption. Determined levels of maximum adsorption capacities were 397 µmol/g far lanthanum, 290 µmol/g for europium and 326 µmol/g for ytterbium (±10%). The results indicated that there were about 100 preferential sites for lanthanum per g of dry biomass. Experiments with mixed-cation solutions showed that the sequence of preferential biosorption was Eu3+ = Yb3+ > La3+. Biomasses dried at 37 and 70°C showed the same selective behavior as wet biomass. Inert microbial biomass dried at 37°C appeared to be the most efficient farm for experimental use. The uptake of lanthanide by P. aeruginosa cells was not affected by the presence of sodium, potassium, calcium, chloride, sulfate and nitrate ions. Aluminum was a strong inhibitor of lanthanide ions biosorption. 87% of the total Al3+ was removed from the 3 mM solution, whereas only 8%, 20% and 3% of the total La3+, Eu3+, and Yb3+, respectively, were sorbed from 3 mM solutions. The results suggested that cells of *Pseudomonas aeruginosa* may find promising applications for removal and separation of lanthanide ions from aqueous effluents.

Keywords: Heavy-Metals, Mycobacterium-Smegmatis, Accumulation, Sorption, Microorganisms, Actinide, Chitosan, Kinetics, Elements, Biomass

Brás, I.P., Santos, L. and Alves, A. (1999), Organochlorine pesticides removal by pinus bark sorption. *Environmental Science & Technology*, **33** (4), 631-634.

Full Text: [E\Env Sci Tec33, 631.pdf](E/Env%20Sci%20Tec33,%20631.pdf)

Abstract: Pesticides belong to a chemical family that calls our attention because of its hazardous effects in the environment. The organochlorine pesticides were strongly used in the past, but their persistency and bioaccumulation make them an actual problem. Common wastewater treatment methods, like activated carbon sorption, mean expensive investment and operating costs. Pine bark is a wood industry byproduct and has a high affinity with hydrophobic compounds because of its organic composition. The aim of this work is to test the capability of this material to remove organochlorine pesticides from water solutions. This capability was quantified by studying the best operating conditions for pine bark fixed bed mini-columns, the yield of removal from spiked water solutions, and the saturation parameters. The yield of removal from spiked organochlorine water solutions ranging from 1 to 10 μg/l, was 97% on average, for heptachlor, aldrin, endrin, dieldrin, DDD, DDT, and DDE. Lindane could not be efficiently adsorbed by this methodology (38% for yield of removal). Saturation studies, performed until 60.00 L of spiked solution/g of adsorbent was reached, did not reveal system rupture. When compared with activated carbon, pine bark displays analogous response, suggesting that for compounds with similar physicochemical characteristics pine bark will play a significant role.

Keywords: Activated Carbon, Area, Heptachlor, Pine Bark, Residues, Soils, Sorption, Wastewater Treatment, Water

Watmough, S.A., Hughes, R.J. and Hutchinson, T.C. (1999), 206Pb/207Pb ratios in tree rings as monitors of environmental change. *Environmental Science & Technology*, **33** (5), 670-673.

Full Text: [E\Env Sci Tec33, 670.pdf](E/Env%20Sci%20Tec33,%20670.pdf)

Abstract: Lead concentrations and Pb-206/Pb-207 ratios were measured in annual tree rings of sycamore (*Acer* *pseudoplatanus* L.) growing at two woodland sites in northwest England. One site, at Prescot, was adjacent to a metal refinery in the center of a large urban conurbation while the site at Croxteth was part of an urban woodland at least 2 km from the nearest major road. Lead concentrations and 206Pb/207Pb ratios in surface soil were higher at Prescot than at Croxteth. At both sites, Pb concentrations decreased considerably in tree rings formed after 1970. At Croxteth, 206Pb/207Pb ratios in tree rings formed between 1965 and 1987 were relatively constant, around 1.16, but increased sharply in wood formed after 1987 to over 1.17 in wood formed in 1993. This increase in the 206Pb/207Pb ratio reflects the recent reduction in Ph derived from vehicle emissions that has a characteristically low 206Pb/207Pb ratio. There was no corresponding increase in the 206Pb/207Pb ratio in tree rings at Prescot, although Pb concentrations in tree rings formed after 1986 remained unchanged. In addition, 206Pb/207Pb ratios at Prescot were generally higher than at Croxteth, and there was considerable annual variation, which is probably due to the multiple sources of Pb at this small woodland site. 206Pb/207Pb ratios in sycamore tree rings may be used to document historical changes in the sources of bioavailable pH, which differ between sites, although the majority of Pb in tree rings at these two woodland sites appears to have been derived from industrial and urban sources rather than from motor vehicle emissions.

Keywords: Plasma-Mass Spectrometry, Lead Pollution, Lake-Sediments, Isotopic Composition, Heavy-Metal, Record, Scotland, Water

Salt, D.E., Prince, R.C., Baker, A.J.M., Raskin, I. and Pickering, I.J. (1999), Zinc ligands in the metal hyperaccumulator Thlaspi caerulescens as determined using X-ray absorption spectroscopy. *Environmental Science & Technology*, **33** (5), 713-717.

Full Text: [E\Env Sci Tec33, 713.pdf](E/Env%20Sci%20Tec33,%20713.pdf)

Abstract: Using the noninvasive technique of X-ray absorption spectroscopy (XAS), we have been able to determine the ligand environment of Zn in different tissues of the Zn-hyperaccumulator Thlaspi caerulescens (J. & C. Presl.). The majority of intracellular Zn in roots of T. caerulescens was found to be coordinated with histidine. In the xylem sap. Zn was found to be transported mainly as the free hydrated Zn2+ cation with a smaller proportion coordinated with organic acids. In the shoots, Zn coordination occurred mainly via organic acids, with a smaller proportion present as the hydrated cation and coordinated with histidine and the cell wall. Our data suggest that histidine plays an important role in Zn homeostasis in the roots, whereas organic acids are involved in xylem transport and Zn storage in shoots.

Keywords: Plant Vacuoles, C-Presl, Accumulation, Mechanisms, Tolerance, Cadmium, Mustard, Cells

Albrecht, I.D., Barkovskii, A.L. and Adriaens, P. (1999), Production and dechlorination of 2,3,7,8-tetrachlorodibenzo-p-dioxin in historically-contaminated estuarine sediments. *Environmental Science & Technology*, **33** (5), 737-744.

Full Text: [E\Env Sci Tec33, 737.pdf](E/Env%20Sci%20Tec33,%20737.pdf)

Abstract: Polychlorinated dibenzo-p-dioxins (PCDD) are ubiquitous and considered to be unreactive to biotic and abiotic transformation processes. Here we demonstrate that sediment-associated 2,3,7,8-substituted dioxin residues in general, and 2,3,7,8-TCDD in particular, are in a state of flux, as they are produced from peri-dechlorination of octaCDD, and further laterally dechlorinated to 2-MCDD. This reaction can be stimulated in the presence of organic acids, 2-monobromodibenzo-p-dioxin (2-MBDD) and hydrogen, which result in the production of HpCDD, 2,3,7,8-TCDD, and 2-MCDD, respectively. The results indicate that dechlorination of 2,3,7,8-TCDD is not likely a rate-limiting step in the hydrogen-stimulated reaction, which presents a potential strategy to decontaminate dioxin-contaminated environments.

Keywords: Dibenzo-Para-Dioxins, Chlorinated Dioxins, Pattern-Recognition, Surficial Sediments, Newark Bay, New-Jersey, p-Dioxins, River, Bioavailability

Yang, J.B. and Volesky, B. (1999), Cadmium biosorption rate in protonated *Sargassum* biomass. *Environmental Science & Technology*, **33** (5), 751-757.

Full Text: [E\Env Sci Tec33, 751.pdf](E/Env%20Sci%20Tec33,%20751.pdf)

Abstract: Biosorption of the heavy metal ion Cd2+ by protonated nonliving brown alga Sargassum fluitans biomass was accompanied by the release of hydrogen protons from the biomass. The uptake of cadmium and the release of proton matched each other throughout the biosorption process. The end-point titration methodology was used to maintain the constant pH 4.0 for developing the dynamic sorption rate. The sorption isotherm could be well represented by the Langmuir sorption model. A mass transfer model assuming the intraparticle diffusion in a one-dimensional thin plate as a controlling step was developed to describe the overall biosorption rate of cadmium ions in flat seaweed biomass particles. The overall biosorption mathematical model equations were solved numerically yielding the effective diffusion coefficient De about 3.5×10-6 cm2/s. This value matches that obtained for the desorption process and is approximately half of that of the molecular diffusion coefficient for cadmium ions in aqueous solution.

Keywords: Ion-Exchange, Calcium Alginate, Heavy-Metals, Algae, Diffusion, Biosorbent, Adsorption, Kinetics, Beads, Cd

Robertson, A.P. and Leckie, J.O. (1999), Acid/base, copper binding, and Cu2+/H+ exchange properties of a soil humic acid, an experimental and modeling study. *Environmental Science & Technology*, **33** (5), 786-795.

Full Text: [E\Env Sci Tec33, 786.pdf](E/Env%20Sci%20Tec33,%20786.pdf)

Abstract: Acid/base, copper binding and proton exchange properties of a soil humic acid were studied over a range of pHs and ionic strengths. Results indicate that multiple classes of copper binding sites exist. A number of model formulations were used to simulate the data, none were able to reasonably match all aspects of the observed behavior. Model results and analyses suggest that successful replication of humic behavior over a wide range of conditions requires a model formulation which incorporates electrostatic effects for a variable geometry entity, multiple site classes, and probably both uni and multi dentate complexation. Additionally site heterogeneity estimates from acid/base titration data are not likely to reasonably assess the presence of low concentration, high (metal) affinity sites that can be relevant in the study of trace metal complexation.

Keywords: Dissolved Organic-Matter, Metal-Ion Binding, Heterogeneous Surfaces, Cation-Binding, Substances, Adsorption, Complexation, Equilibria, Protons, pH

Diallo, M.S., Balogh, L., Shafagati, A., Johnson, J.H., Goddard, W.A. and Tomalia, D.A. (1999), Poly(amidoamine) dendrimers: A new class of high capacity chelating agents for Cu(II) ions. *Environmental Science & Technology*, **33** (5), 820-824.

Full Text: [E\Env Sci Tec33, 820.pdf](E/Env%20Sci%20Tec33,%20820.pdf)

Abstract: This communication describes preliminary results of an experimental investigation of the binding of Cu(II) ions to poly(amidoamine) (PAMAM) dendrimers in aqueous solutions. Dendrimers are highly branched polymers with controlled composition and architecture consisting of three structural components: a core, interior branch cells, and terminal branch cells. PAMAM dendrimers possess functional nitrogen and amide groups arranged in regular “branched upon branched” patterns which are displayed in geometrically progressive numbers as a function of generation level. Terminal groups of PAMAM dendrimers may be any organic substituent such as primary amines, carboxylic groups, etc. In aqueous solutions, PAMAM dendrimers can serve as high capacity nanoscale containers for toxic metal ions such as Cu(II). Compared to traditional chelating agents (e.g., triethylene tetramine) and macrocyles (e.g., cyclams) with nitrogen donors, which can typically bind only one Cu(II) ion per molecule, a generation eight (G8) PAMAM dendrimer can bind up 153±20 Cu(II) ions per molecule. This clearly illustrates a distinct advantage of dendrimers over traditional chelating agents and macrocycles, that is the covalent attachment of nitrogen ligands to conformationally flexible PAMAM chains enclosed within a nanoscopic structure results in a substantial increase in binding capacity.

Keywords: Water

Murray, K.S., Cauvet, D., Lybeer, M. and Thomas, J.C. (1999), Particle size and chemical control of heavy metals in bed sediment from the Rouge River, southeast Michigan. *Environmental Science & Technology*, **33** (7), 987-992.

Full Text: [E\Env Sci Tec33, 987.pdf](E/Env%20Sci%20Tec33,%20987.pdf)

Abstract: Anthropogenic activities related to 100 years of industrialization in the metropolitan Detroit area have significantly enriched the bed sediment of the lower reaches of the Rouge River in Cr, Cu, Fe, Ni, Pb, and Zn. These enriched elements, which may represent a threat to biota, are predominantly present in sequentially extracted reducible and oxidizable chemical phases with small contributions from residual phases. In size-fractionated samples (>300, 300-75, 75-38, 38-17, and 17 µm) trace metal concentrations generally increase with decreasing particle size, with the greatest contribution to this increase from the oxidizable phase. Experimental results obtained on replicate samples of river sediment demonstrate that the accuracy of the sequential extraction procedure, evaluated by comparing the sums of the three individual fractions, is generally better than 10%. Oxidizable and reducible phases therefore constitute important sources of potentially available heavy metals that need to be explicitly considered when evaluating sediment and water quality impacts on biota.

Jain, A., Raven, K.P. and Loeppert, R.H. (1999), Arsenite and arsenate adsorption on ferrihydrite: Surface charge reduction and net OH- release stoichiometry. *Environmental Science & Technology*, **33** (8), 1179-1184.

Full Text: [E\Env Sci Tec33, 1179.pdf](E/Env%20Sci%20Tec33,%201179.pdf)

Abstract: Arsenite [As(III)] and arsenate [As(V)] are highly toxic inorganic arsenic species that represent a potential threat to the environment and human health. Iron oxides including poorly crystalline oxides, e.g., ferrihydrite, play a significant role in controlling dissolved As concentration and limit the mobility and bioavailability of As(III) and As(V). Adsorption occurs by ligand exchange of the As species for OH2 and OH- in the coordination spheres of surface structural Fe atoms. The objective of this study was to evaluate H+/OH- release stoichiometry and changes in surface charge properties of the adsorbent during the adsorption of arsenite and arsenate on ferrihydrite in the pH range of 4-10. This information, which is not directly accessible through spectroscopic studies, provides important clues to bonding mechanism. While arsenate adsorption resulted in the net release of OH- at pH 4.6 and 9.2, arsenite adsorption resulted in net OH- release at pH 9.2 and net H+ release at pH 4.6. The amount of H+ or OH- release per mole of adsorbed As varied with the As surface coverage, indicating that different mechanisms of arsenic adsorption predominate at low versus high coverage. The experimentally observed surface charge reduction and net OH- release stoichiometry were compared with the theoretical stoichiometry of the surface adsorption reactions that might occur. The results provide evidence that during arsenite adsorption at low pH, i.e., pH 4.6, the oxygen of the Fe-O-As bond remained partially protonated as FeO(H)-As. There is evidence that the monodentate bonding mechanism might play an increasing role during arsenate adsorption on ferrihydrite with increasing pH (at pH > 8). The results of this study have provided ancillary evidence to support the experimentally observed reduced adsorption of arsenite at low pH and of arsenate at high pH.

Keywords: Amorphous Iron Hydroxide, Hydrous Ferric-Oxide, Aqueous-Solution, Phosphate, Sulfate, Soils, Chemistry, Kinetics, Goethite, Removal

Peters, S.C., Blum, J.D., Klaue, B. and Karagas, M.R. (1999), Arsenic occurrence in New Hampshire drinking water. *Environmental Science & Technology*, **33** (9), 1328-1333.

Full Text: [E\Env Sci Tec33, 1328.pdf](E/Env%20Sci%20Tec33,%201328.pdf)

Abstract: Arsenic concentrations were measured in 992 drinking water samples collected from New Hampshire households using online hydride generation ICP-MS. These randomly selected household water samples contain much less arsenic than those voluntarily submitted for analysis to the New Hampshire Department of Environmental Services (NHDES). Extrapolation of the voluntarily submitted sample set to all New Hampshire residents significantly overestimates arsenic exposure. In randomly selected households, concentrations ranged from <0.0003 to 180 µg/L, with water from domestic wells containing significantly more arsenic than water from municipal sources. Water samples from drilled bedrock wells had the highest arsenic concentrations, while samples from surficial wells had the lowest arsenic concentrations. We suggest that much of the groundwater arsenic in New Hampshire is derived from weathering of bedrock materials and not from anthropogenic contamination. The spatial distribution of elevated arsenic concentrations (>50 µg/L) correlates with Late-Devonian Concord-type granitic bedrock. Field observations in the region exhibiting the highest groundwater arsenic concentrations revealed abundant pegmatite dikes associated with nearby granites. Analysis of rock digests indicates arsenic concentrations up to 60 mg/kg in pegmatites, with much lower values in surrounding schists and granites. Weak acid leaches show that approximately half of the total arsenic in the pegmatites is labile and therefore can be mobilized during rock-water interaction.

Keywords: Speciation, Cancer

Weiss, D., Shotyk, W., Appleby, P.G., Kramers, I.D. and Cheburkin, A.K. (1999), Atmospheric Ph deposition since the industrial revolution recorded by five Swiss peat profiles: Enrichment factors, fluxes, isotopic composition, and sources. *Environmental Science & Technology*, **33** (9), 1340-1352.

Full Text: [E\Env Sci Tec33, 1340.pdf](E/Env%20Sci%20Tec33,%201340.pdf)

Abstract: Atmospheric Pb deposition since the Industrial Revolution was studied in western, central, and southern Switzerland using five rural peat bogs. Similar temporal patterns were found in western and central Switzerland, with two distinct periods of Pb enrichment relative to the natural background: between 1880 and 1920 with enrichments ranging from 40 to 80 times, and between 1960 and 1980 with enrichments ranging from 80 to 100 times. The fluxes also were generally elevated in those time periods: in western Switzerland between 1.16 and 1.55 µg cm-2 y-1 during the first period, and in western and central Switzerland between 0.85 and 1.55 µg cm-2 y-1 during the second period. Between the Industrial Revolution and 1985, nonradiogenic Pb became increasingly important in all five cores because of the replacement of coal by oil after ca. 1920, the use of Australian Pb in industry, and the extensive combustion of leaded gasoline after 1950. The introduction of unleaded gasoline in 1985 had a pronounced effect on the Pb deposition in all five cores. Enrichments dropped sharply (between 2 and 4 times), and the isotopic ratios reverted back toward (but not achieving) natural values. The cores from western and central Switzerland showed very similar isotopic trends throughout the time period studied, implying that these sites were influenced contemporaneously by similar pollution sources and atmospheric pathways. Southern Switzerland revealed a different record with respect to the Pb pollution: it was dominated by a single massive Pb enrichment dated between 1930 and 1950. During this period the Pb enrichment factor reached similar to 200 times background and the pH flux was similar to 27 µg cm-2 y-1, more than an order of magnitude higher that at the western and central sites. This core also had significantly different post-1950 changes in the Pb isotope ratios.

Keywords: Multielement Analyzer Emma, Stable Lead Isotopes, Jura Mountains, Lake-Sediments, United-Kingdom, Bog Profiles, Switzerland, Pollution, Pb, Ratios

Benyahya, L. and Garnier, J.M. (1999), Effect of salicylic acid upon trace-metal sorption (Cd-II, Zn-II, Co-II, and Mn-II) onto alumina, silica, and kaolinite as a function of pH. *Environmental Science & Technology*, **33** (9), 1398-1407.

Full Text: [E\Env Sci Tec33, 1398.pdf](E/Env%20Sci%20Tec33,%201398.pdf)

Abstract: The sorption of four trace metals (Cd-II, Zn-II, Co-II, and Mn-II) onto alumina, silica, and kaolinite, in the presence or absence of salicylic acid (as well as the salicylic acid sorption), was investigated in batch experiments in the pH range from 4 to 9. The sorption was interpreted in terms of surface complexation using the diffuse layer model (DLM). Equilibrium parameters were optimized using the FITEQL program. The salicylic acid was only significantly sorbed onto the alumina and the sorption was modeled using the anionic monodentate surface complex. In the absence of salicylic acid, the sorption of the trace metals presented different pH edge behaviors, depending on the substrate. Using the cationic monodentate surface complex, the model fitted the experimental data well. In the presence of salicylic acid, at a given pH and depending on the substrate, the sorption of metals was (i) increased, suggesting the occurrence of ternary complexes, (II) reduced (sometimes totally inhibited), due to the complexation with dissolved salicylic acid, or (iii) very weakly changed, in terms of net effect compared to free-organic-ligand systems. Modeling of the trace-metal sorption in the presence of salicylic acid was performed using ternary surface complexes. In the acidic pH range, this allowed the experimental data to be simulated, but in the alkaline pH range, the model failed to simulate the decrease in sorption. Probable causes of the discrepancies between the experimental data and modeling results are discussed.

Keywords: Aquatic Humic Substances, Natural Organic-Matter, Oxide-Water Interface, Surface Complexation, Hydrous Gamma-Al2O3, Amorphous Silica, Aqueous-Solution, Edta Complexes, Fresh-Water, Iron-Oxides

Benyahya, L. and Garnier, J.M. (1999), Effect of salicylic acid upon trace-metal sorption (CdII, ZnII, CoII, and MnII) onto alumina, silica, and kaolinite as a function of pH. *Environmental Science & Technology*, **33** (9), 1439-1443.

Full Text: [E\Env Sci Tec33, 1439.pdf](E/Env%20Sci%20Tec33,%201439.pdf)

Abstract: The sorption of four trace metals (Cd-II, Zn-II, Co-II, and Mn-II) onto alumina, silica, and kaolinite, in the presence or absence of salicylic acid (as well as the salicylic acid sorption), was investigated in batch experiments in the pH range from 4 to 9. The sorption was interpreted in terms of surface complexation using the diffuse layer model (DLM). Equilibrium parameters were optimized using the FITEQL program. The salicylic acid was only significantly sorbed onto the alumina and the sorption was modeled using the anionic monodentate surface complex. In the absence of salicylic acid, the sorption of the trace metals presented different pH edge behaviors, depending on the substrate. Using the cationic monodentate surface complex, the model fitted the experimental data well. In the presence of salicylic acid, at a given pH and depending on the substrate, the sorption of metals was (i) increased, suggesting the occurrence of ternary complexes, (II) reduced (sometimes totally inhibited), due to the complexation with dissolved salicylic acid, or (iii) very weakly changed, in terms of net effect compared to free-organic-ligand systems. Modeling of the trace-metal sorption in the presence of salicylic acid was performed using ternary surface complexes. In the acidic pH range, this allowed the experimental data to be simulated, but in the alkaline pH range, the model failed to simulate the decrease in sorption. Probable causes of the discrepancies between the experimental data and modeling results are discussed.

Keywords: Aquatic Humic Substances, Natural Organic-Matter, Oxide-Water Interface, Surface Complexation, Hydrous Gamma-Al2O3, Amorphous Silica, Aqueous-Solution, Edta Complexes, Fresh-Water, Iron-Oxides

Maurice, P.A. and Namjesnik-Dejanovic, K. (1999), Aggregate structures of sorbed humic substances observed in aqueous solution. *Environmental Science & Technology*, **33** (9), 1538-1541.

Full Text: [E\Env Sci Tec33, 1538.pdf](E/Env%20Sci%20Tec33,%201538.pdf)

Abstract: Humic substances are high molecular weight, heterogeneous organic materials which dominate the natural organic matter pool in many aquatic environments and often form coatings on mineral surfaces. Humic substances sorbed to mineral surfaces may bind and hence immobilize trace metals, radionuclides, and nonionic organic pollutants, and they may also alter clay-mineral flocculation kinetics. Determining the physical shapes and forms of sorbed humic substances is essential for development of realistic pollutant-binding models. To this end, we are using direct, in-situ (in 0.01 M CaCl2, less than or equal to 100 mg C L-1 solution, pH similar to 5), nanometer-scale atomic force microscopy (AFM) to image the physical shapes and forms of humic substances sorbed to the basal-plane surface of mica. Under our experimental conditions, the sorbed molecules form ring-shaped aggregates with diameters on the scale of several tens of nanometers, smaller nanometer-scale rings present along the circumference could potentially represent hydrophobic domains. The highly porous three-dimensional copolymeric nature of the sorbed humic substances has important implications for reactivity at the soil particle-solution interface. Ongoing research focuses on determining the effects of changing solution conditions and sorbent properties on the shapes and forms of sorbed humic substances.

Keywords: Acids, Microscopy, Adsorption, Soil

Johnson, M.D., Huang, W.L., Dang, Z. and Weber, Jr., W.J. (1999), A Distributed reactivity model for sorption by soils and sediments. 12. Effects of subcritical water extraction and alterations of soil organic matter on sorption equilibria. *Environmental Science & Technology*, **33** (10), 1657-1663.

Full Text: [E\Env Sci Tec33, 1657.pdf](E/Env%20Sci%20Tec33,%201657.pdf)

Abstract: Subcritical water extraction was used as a tool to remove the carboxylic, aliphatic, and carbohydrate types of organic carbon from a humic soil. The rates and extents of soil organic carbon removal were quantified as functions of superheated water temperature, phase, and exposure time. The experimental data suggest that superheated water effects deoxygenation/aromatization reactions of soil organic matter that mimic those of geologically slow, natural diagenesis processes. Phenanthrene sorption and desorption equilibrium isotherms for the altered soils were measured. The sorption isotherms were characterized by increasing capacity and nonlinearity with increasing degree of polar functionality removal and simulated diagenesis of the soil organic matter.

Schneider, I.A.H. and Rubio, J. (1999), Sorption of heavy metal ions by the nonliving biomass of freshwater macrophytes. *Environmental Science & Technology*, **33** (13), 2213-2217.

Full Text: [E\Env Sci Tec33, 2213.pdf](E/Env%20Sci%20Tec33,%202213.pdf)

Abstract: The removal of heavy metal ions by the nonliving biomass of aquatic macrophytes was investigated. The work involved studies of physical and biochemical properties of the materials, batch sorption experiments carried out in agitation flasks, and continuous runs in a packed bed column at laboratory scale. Results showed that the dried biomass of Potamogeton lucens, Salvinia herzogii, and Eichhornia crassipes were excellent biosorbents for Cr(III), Ni(II), Cu(II), Zn(II), Cd(II), and Pb(II). The sorption mechanism by these biomaterials was found to proceed mainly by ion exchange reactions between the metal ions and the cationic weak exchanger groups present on the plant surface. Sorption followed the Langmuir isotherm, and maximum metal uptakes values (independently of the metal ion species) were attained at about 1.5 mequiv g-1 for P. lucens, 0.9 mequiv g-1 for S. herzogii, and 0.7 mequiv g-1 for E. crassipes. Advantages and disadvantages found in the use of these natural adsorbents for heavy metals ions present in industrial wastewaters are envisaged.

Keywords: Water Hyacinth, Eichhornia-Crassipes, Cadmium Uptake, Exchange, Cd, Zn

Crist, R.H., Martin, J.R. and Crist, D.R. (1999), Interaction of metal ions with acid sites of biosorbents peat moss and Vaucheria and model substances alginic and humic acids. *Environmental Science & Technology*, **33** (13), 2252-2256.

Full Text: [E\Env Sci Tec33, 1439.pdf](E/Env%20Sci%20Tec33,%201439.pdf)

Abstract: The sorption of four trace metals (Cd-II, Zn-II, Co-II, and Mn-II) onto alumina, silica, and kaolinite, in the presence or absence of salicylic acid (as well as the salicylic acid sorption), was investigated in batch experiments in the pH range from 4 to 9. The sorption was interpreted in terms of surface complexation using the diffuse layer model (DLM). Equilibrium parameters were optimized using the FITEQL program. The salicylic acid was only significantly sorbed onto the alumina and the sorption was modeled using the anionic monodentate surface complex. In the absence of salicylic acid, the sorption of the trace metals presented different pH edge behaviors, depending on the substrate. Using the cationic monodentate surface complex, the model fitted the experimental data well. In the presence of salicylic acid, at a given pH and depending on the substrate, the sorption of metals was (i) increased, suggesting the occurrence of ternary complexes, (II) reduced (sometimes totally inhibited), due to the complexation with dissolved salicylic acid, or (iii) very weakly changed, in terms of net effect compared to free-organic-ligand systems. Modeling of the trace-metal sorption in the presence of salicylic acid was performed using ternary surface complexes. In the acidic pH range, this allowed the experimental data to be simulated, but in the alkaline pH range, the model failed to simulate the decrease in sorption. Probable causes of the discrepancies between the experimental data and modeling results are discussed.

Keywords: Aquatic Humic Substances, Natural Organic-Matter, Oxide-Water Interface, Surface Complexation, Hydrous Gamma-Al2O3, Amorphous Silica, Aqueous-Solution, Edta Complexes, Fresh-Water, Iron-Oxides

Maurice, P.A. and Namjesnik-Dejanovic, K. (1999), Aggregate structures of sorbed humic substances observed in aqueous solution. *Environmental Science & Technology*, **33** (9), 1538-1541.

Full Text: [E\Env Sci Tec33, 1538.pdf](E/Env%20Sci%20Tec33,%201538.pdf)

Abstract: Humic substances are high molecular weight, heterogeneous organic materials which dominate the natural organic matter pool in many aquatic environments and often form coatings on mineral surfaces. Humic substances sorbed to mineral surfaces may bind and hence immobilize trace metals, radionuclides, and nonionic organic pollutants, and they may also alter clay-mineral flocculation kinetics. Determining the physical shapes and forms of sorbed humic substances is essential for development of realistic pollutant-binding models. To this end, we are using direct, in-situ (in 0.01 M CaCl2, less than or equal to 100 mg C L-1 solution, pH similar to 5), nanometer-scale atomic force microscopy (AFM) to image the physical shapes and forms of humic substances sorbed to the basal-plane surface of mica. Under our experimental conditions, the sorbed molecules form ring-shaped aggregates with diameters on the scale of several tens of nanometers, smaller nanometer-scale rings present along the circumference could potentially represent hydrophobic domains. The highly porous three-dimensional copolymeric nature of the sorbed humic substances has important implications for reactivity at the soil particle-solution interface. Ongoing research focuses on determining the effects of changing solution conditions and sorbent properties on the shapes and forms of sorbed humic substances.

Keywords: Acids, Microscopy, Adsorption, Soil

? Schauer, J.J., Kleeman, M.J., Cass, G.R. and Simoneit, B.R.T. (1999), Measurement of emissions from air pollution sources. 2. C-1 through C-30 organic compounds from medium duty diesel trucks. *Environmental Science & Technology*, **33** (10), 1578-1587.

Full Text: [1999\Env Sci Tec33, 1578.pdf](1999/Env%20Sci%20Tec33,%201578.pdf)

Abstract: Gas- and particle-phase tailpipe emissions from late-model medium duty diesel trucks are quantified using a two-stage dilution-source sampling system. The diesel trucks are driven through the hot-start Federal Test Procedure (FTP) urban driving cycle on a transient chassis dynamometer. Emission rates-of 52 gas-phase volatile hydrocarbons, 67 semivolatile and 28 particle-phase organic compounds, and 26 carbonyls are quantified along with fine particle mass and chemical composition. When all C-1-C-13 carbonyls are combined, they account for 60% of the gas-phase organic compound mass,emissions. Fine particulate matter emission rates and chemical composition are quantified simultaneously by two methods: a denuder/filter/PUF sampler and a traditional-filter sampler. Both sampling techniques yield the same elemental carbon emission rate of 56 mg km-1 driven, but the particulate organic carbon emission rate determined by the denuder-based sampling technique is found to be 35% lower than the organic carbon mass collected by the traditional filter-based sampling technique due to a positive vapor-phase sorption artifact that affects the traditional filter sampling technique. The distribution of organic compounds in the diesel fuel used in this study is compared to the distribution of these compounds in the vehicle exhaust Significant enrichment in the ratio of unsubstituted polycyclic aromatic hydrocarbons (PAH) to their methyl- and dimethyl-substituted homologues is observed in the tailpipe emissions relative to the fuel. Isoprenoids and tricyclic terpanes are quantified in the semivolatile organics emitted from diesel vehicles. When used in conjunction with data on the hopanes, steranes, and elemental carbon emitted, the isoprenoids and the tricyclic terpanes may help trace the presence of diesel exhaust lin atmospheric samples.

Keywords: Polycyclic Aromatic-Hydrocarbons, Model Evaluation Data, Ambient Air, Aerosol, Distributions, Combustion, Carbonyls, Exhaust

Notes: highly cited

? Kleineidam, S., Rugner, H., Ligouis, B. and Grathwohl, P. (1999), Organic matter facies and equilibrium sorption of phenanthrene. *Environmental Science & Technology*, **33** (10), 1637-1644.

Full Text: [1999\Env Sci Tec33, 1637.pdf](1999/Env%20Sci%20Tec33,%201637.pdf)

Abstract: Remediation of groundwater contamination in unconsolidated aquifers by dissolved hydrophobic compounds (HOC) requires detailed information on the sorption parameters present in the sediments. Equilibrium sorption isotherms were measured for phenanthrene for a wide variety of lithe components (constituents of sand and gravel sediments) and unweathered rock fragments (limestones and sandstones). The lithocomponents were separated based on macroscopic appearance of different lithologies (e.g. limestones, sandstones, shales, mudstones, and igneous rocks) and characterized in terms of organic carbon content and specific surface area. In addition the organic matter (OM) was characterized using coal petrography methods (white and UV light microscopy). As confirmed by heat-treated samples sorption was solely due to OM. Organic carbon normalized sorption coefficients (K-OC) varied by almost 3 orders of magnitude among the samples investigated. The different origin and maturity of isolated organic matter (organic facies) is believed to be responsible. For example, extremely high K-OC values were found for particulate organic matter such as charcoal and coal particles which were preserved within the sandstone and limestone grains. In a second paper we report data on sorption kinetics of the samples used in this study (1).

Keywords: Aqueous Solubility, Aromatic-Hydrocarbons, Carbon, Chemical Partition, Deep-Sea Sediments, Distributed Reactivity Model, Equilibrium, HOC, Isotherms, Kinetics, Natural Sediments, Particles, Sediments, Soils, Sorption, Surface Area, Thermodynamics

Johnson, M.D., Huang, W.L., Dang, Z. and Weber, Jr., W.J. (1999), A Distributed reactivity model for sorption by soils and sediments. 12. Effects of subcritical water extraction and alterations of soil organic matter on sorption equilibria. *Environmental Science & Technology*, **33** (10), 1657-1663.

Full Text: [E\Env Sci Tec33, 1657.pdf](E/Env%20Sci%20Tec33,%201657.pdf)

Abstract: Subcritical water extraction was used as a tool to remove the carboxylic, aliphatic, and carbohydrate types of organic carbon from a humic soil. The rates and extents of soil organic carbon removal were quantified as functions of superheated water temperature, phase, and exposure time. The experimental data suggest that superheated water effects deoxygenation/aromatization reactions of soil organic matter that mimic those of geologically slow, natural diagenesis processes. Phenanthrene sorption and desorption equilibrium isotherms for the altered soils were measured. The sorption isotherms were characterized by increasing capacity and nonlinearity with increasing degree of polar functionality removal and simulated diagenesis of the soil organic matter.

? Lefevre, G., Alnot, M., Ehrhardt, J.J. and Bessiere, J. (1999), Uptake of iodide by a mixture of metallic copper and cupric compounds. *Environmental Science & Technology*, **33** (10), 1732-1737.

Full Text: [1999\Env Sci Tec33, 1732.pdf](1999/Env%20Sci%20Tec33,%201732.pdf)

Abstract: Ability of copper/cupric compound mixtures to remove iodide from solution was investigated to predict sorption of radioactive iodine in the environment and to assess their use in a nuclear reprocessing method. Thermodynamic calculations were performed to study the stability of such mixtures in solution and to obtain equilibrium constants of Cu(0)/Cu(II)/I- and Cu(0)/Cu(II)/Cl- systems. Both calculations and experimental results showed that a Cu(0)/ Cu-3(OH)(2)(CO3)(2)(azurite) mixture selectively uptakes iodide ions(initial:concentrations: 10-2 and 10-1 M) in the presence of 10-1 M chloride ions. Reaction of iodide with copper powder and azurite crystal or copper plate and azurite powder have also been investigated, leading to precipitation of Cut onto massive copper phase. The different solids were separately analyzed by XPS and MEB-EDX, giving some insight in the uptake mechanism. It is proposed that soluble copper released by the cupric compound is reduced at the surface of metallic copper, leading to a preferential precipitation of Gut on copper surface.

Keywords: Adsorption, Chloride, Copper, Corrosion, Cu2O, CuO, Environment, Equilibrium, I-129 Waste Management, Iodine, Ions, Mechanism, Mixture, Mixtures, Precipitation, Predict, Sorption, Stability, Surface, Uptake, XPS

Schneider, I.A.H. and Rubio, J. (1999), Sorption of heavy metal ions by the nonliving biomass of freshwater macrophytes. *Environmental Science & Technology*, **33** (13), 2213-2217.

Full Text: [E\Env Sci Tec33, 2213.pdf](E/Env%20Sci%20Tec33,%202213.pdf)

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Keywords: Water Hyacinth, Eichhornia-Crassipes, Cadmium Uptake, Exchange, Cd, Zn

Crist, R.H., Martin, J.R. and Crist, D.R. (1999), Interaction of metal ions with acid sites of biosorbents peat moss and Vaucheria and model substances alginic and humic acids. *Environmental Science & Technology*, **33** (13), 2252-2256.

Full Text: [E\Env Sci Tec33, 2252.pdf](E/Env%20Sci%20Tec33,%202252.pdf)

Abstract: The interaction between added metal ions and acid sites of two biosorbents, peat moss and the alga Vaucheria, was studied. Results were interpreted in terms of two model substances, alginic aCid, A. copolymer of guluronic and mannuronic acids present in marine algae, and humic acid in peat moss. For peat moss and Vaucheria at pH 4-6, two protons were displaced per Cd sorbed, after correction for sorbed metals also displaced by the heavy metal. The frequent neglect of exchange of heavy metals for metals either sorbed on the native material or added for pH adjustment leads to erroneous conclusions about proton displacement stoichiometry. Proton displacement constants K-ex (H) decreased logarithmically with pH and had similar slopes for alginic acid and biosorbents. This pH effect was interpreted as an electrostatic effect of increasing anionic charge making proton removal less favorable. The maximum number of exchangeable acid sites (capacity C-H) decreased with pH for alginic acid but increased with pH for biosorbents. Consistent with titration behavior, this difference was explained in terms of more weak acid sites in the biosorbents.

Keywords: Poly-Electrolyte Properties, Marine-Algae, Physicochemical Description, Complexation Equilibria, Protonation Equilibria, Fulvic-Acids, Cell-Walls, Adsorption, Biosorption, Exchange

Haugen, J.E., Wania, F. and Lei, Y.D. (1999), Polychlorinated biphenyls in the atmosphere of southern Norway. *Environmental Science & Technology*, **33** (14), 2340-2345.

Full Text: [E\Env Sci Tec33, 2340.pdf](E/Env%20Sci%20Tec33,%202340.pdf)

Abstract: Atmospheric concentrations of seven polychlorinated biphenyl (PCB) congeners (IUPAC No. 101, 105, 118, 138/163, 153, 156, 180) were measured every week from 1992 to 1995 in Lista, a coastal station in Southern Norway. This data set of 200 samples was analyzed with respect to the influence of time, temperature, air mass origin, and wind speed on both the absolute level and the relative congeneric composition of the PCBs. The geometric mean concentration of the sum of the seven PCB congeners was 114 pg.m-3, which is in the range observed at urban locations in Europe during the early 1990s. No obvious concentration decrease could be observed during the 4 years. PCB concentrations showed a clear seasonal fluctuation with higher levels during the summer. The temperature dependence of the air concentrations of individual congeners increased with the number of chlorine atoms per molecule resulting in an increase in the relative importance of the higher chlorinated congeners during warm periods. Air arriving in Southern Norway from southwesterly directions had slightly higher concentrations than air coming from the North, whereas the relative composition of the PCB congeners was not influenced by air mass origin. At higher wind speed the concentrations of PCBs decreased. Episodes of conspicuously elevated PCB concentrations neither were associated with a particular air mass origin nor had an unusual congeneric composition. The data analysis suggests that whereas regional air transport from central Europe contributes to the occurrence of PCBs in Lista, a large fraction of the PCBs stems likely from local sources.

Keywords: Organic-Compounds, Temperature-Dependence, Temporal Trends, Air, PCBS, Organochlorines, Deposition, Surface

Bargar, J.R., Reitmeyer, R. and Davis, J.A. (1999), Spectroscopic confirmation of uranium(VI)-carbonato adsorption complexes on hematite. *Environmental Science & Technology*, **33** (14), 2481-2484.

Full Text: [E\Env Sci Tec33, 2481.pdf](E/Env%20Sci%20Tec33,%202481.pdf)

Abstract: Evaluating societal risks posed by uranium contamination from waste management facilities, mining sites, and heavy industry requires knowledge about uranium transport in groundwater, often the most significant pathway of exposure to humans. It has been proposed that uranium mobility in aquifers may be controlled by adsorption of U(VI)-carbonato complexes on oxide minerals. The existence of such complexes has not been demonstrated, and little is known about their compositions and reaction stoichiometries. We have used attenuated total reflectance Fourier transform infrared (ATR-FTIR) and extended X-ray absorption fine structure (EXAFS) spectroscopies to probe the existence, structures, and compositions of = FeOsurface-U(VI)-carbonato complexes on hematite throughout the pH range of uranyl uptake under conditions relevant to aquifers. U(VI)-carbonato complexes were found to be the predominant adsorbed U(VI) species at all pH values examined, a much wider pH range than previously postulated based on analogy to aqueous U(VI)-carbonato complexes,, which are trace constituents at pH < 6. This result indicates the inadequacy of the common modeling assumption that the compositions and predominance of adsorbed species can be inferred from aqueous species. By extension, adsorbed carbonate complexes may be of major importance to the groundwater transport of similar actinide contaminants such as neptunium and plutonium.

Keywords: Carbonate Complexes, Aqueous-Solution, Uranyl, Goethite, Model, Ion

Eljarrat, E., Caixach, J. and Rivera, J. (1999), Decline in PCDD and PCDF levels in sewage sludges from Catalonia (Spain). *Environmental Science & Technology*, **33** (15), 2493-2498.

Full Text: [E\Env Sci Tec33, 2493.pdf](E/Env%20Sci%20Tec33,%202493.pdf)

Abstract: Nineteen sewage sludges from rural and urban wastewater treatment plants (WWTPs) in Catalonia (Spain) were analyzed for PCDDs and PCDFs using: HRGC-HRMS to determine the present levels of contamination. Total I-TEQ values for these samples ranged from 7 to 160 pg/g, with a mean value of 55 pg/g and a median value of 42 pg/ g. Moreover, archived sewage sludge samples collected and stored between 1979 and 1987 from 15 WWTPs were analyzed to gain some, insight into temporal trends and possible variations in source inputs. Total I-TEQ values for archived samples ranged from 29 to 8300 pg/g, with a mean value of 620 pg/g and a median value of 110 pg/g. Our findings show that contemporary sewage sludge PCDD/F concentrations have declined since the 1980s. In addition to the variations in PCDD and PCDF concentrations, there were also some changes in the isomeric patterns. These variations in levels and isomeric patterns could reflect changes in PCDD and PCDF sources to the environment over time.

Keywords: Dibenzo-p-Dioxins, Samples, Pentachlorophenol, Biphenyls, River, Water, UK

Shin, D.H., Choi, S.M., Oh, J.E. and Chang, Y.S. (1999), Evaluation of polychlorinated dibenzo-p-dioxin/dibenzofuran (PCDD/F) emission in municipal solid waste incinerators. *Environmental Science & Technology*, **33** (15), 2657-2666.

Full Text: [E\Env Sci Tec33, 2657.pdf](E/Env%20Sci%20Tec33,%202657.pdf)

Abstract: This paper summarizes an engineering approach taken for 10 commercial MSW incinerators to formulate a basis for PCDD/F emission reduction schemes and to interpret the measurement results before and after the plant modifications of moderate scale. Control strategy of PCDD/F emission from the operating incinerators can be established on the basis of the interpretation of reliable measurements as well as understanding of the formation/destruction processes. The fate of PCDD/F is known to be influenced by the flue gas subprocesses: the initial formation/oxidation in the combustion chamber, reformation through synthesis, removal by adsorption, and catalytic destruction. A simplified model is proposed for PCDD/F level at various stages of the flue gas, basically integrating the reaction kinetic rates at the corresponding state. Since the kinetic rate is dependent on temperature, time-temperature history of the flue gas is considered as the important input data. Using the plant design and operating conditions, this global prediction model calculates the PCDD/F level not only at the stack but also at the process midstream. The model predictions are discussed along with measurement results from the different design of incinerator plants.

Keywords: De-Novo-Synthesis, Fly-Ash, Flue-Gas, Chlorophenol Reactions, Refuse Incineration, Msw Incinerators, Fabric Filter, Dioxins, Carbon, Combustion

Spear, J.R., Figueroa, L.A. and Honeyman, B.D. (1999), Modeling the removal of uranium U(VI) from aqueous solutions in the presence of sulfate reducing bacteria. *Environmental Science & Technology*, **33** (15), 2667-2675.

Full Text: [E\Env Sci Tec33, 2667.pdf](E/Env%20Sci%20Tec33,%202667.pdf)

Abstract: The reduction kinetics of soluble hexavalent uranium (U(VI)) to insoluble tetravalent U(IV) by both a mixed culture of wild-type sulfate-reducing bacteria (SRB) and a pure culture of Desulfovibrio desulfuricans (ATCC 7757) were studied at variable cell concentrations. The SRB were grown in chemostats, and the uranium reduction kinetics were evaluated from batch experiments at 21°C. The initial U(VI) concentration was 1 mM, while the initial cell concentration varied from 0.18 to 1.27 mg dry wt/mL. A modified nongrowth Monod model best fit the data across all cell concentrations. For the mixed culture, average values for the maximum specific reaction rate, k(U), and for the half saturation constant, K-U, are 0.023 mM U(VI)/min.mg cells and 0.25 mM U(VI), for D. desulfuricans, k(U) is 0.030 mM U(VI)I min mg SRB and K-U is 0.50 mM U(VI). A lag-time before enzymatic U(VI) reduction occurred was present for systems tested and was inversely correlated to cell concentration, Transmission electron microscopy (TEM) of the cell/precipitate suspension after U(VI) reduction indicated an extracellular amorphous mass of electron dense material. Examination of the cell/precipitate suspension with X-ray Photoelectron Spectroscopy (XPS) indicated the presence of U(IV). The determined rate constants can be used to design an SRB dominated bioreactor for U removal from aqueous solutions.

Keywords: Enzymatically-Mediated Growth, Citrobacter sp, Reduction, Desulfovibrio, Bioaccumulation, Accumulation, Water, Iron

Avena, M.J. and Koopal, L.K. (1999), Kinetics of humic acid adsorption at solid-water interfaces. *Environmental Science & Technology*, **33** (16), 2739-2744.

Full Text: [E\Env Sci Tec33, 2739.pdf](E/Env%20Sci%20Tec33,%202739.pdf)

Abstract: The adsorption kinetics of purified Aldrich humic acid (PAHA) onto hydrophilic (Fe2O3 and Al2O3) and hydrophobic (polystyrene and silanized SiO2) surfaces are studied by reflectometry. The initial rate of adsorption depends on the rate of transport and the rate of attachment. Attachment on hydrophilic surfaces is relatively fast at low pH where surface and HA attract each other electrostatically. Moreover, carboxylic and phenolic groups are exposed to the outside of the HA molecules, and these groups form complexes with surface hydroxyl groups. Due to the high attachment rate the process is transport-limited. At high. pH, where surface and HA repel each other electrostatically, attachment is slow, and the adsorption rate is attachment-limited. At hydrophobic surfaces attachment of HA takes place through hydrophobic attraction. Hydrophobic groups are hidden in the inner part of HA molecules, and structural rearrangements are required before attachment. can occur. The slow attachment leads to an attachment-limited rate. Increasing the pH increases the number of charged groups at the outside of the molecules, and the rate of attachment becomes even slower. Adsorption rate variations with electrolyte concentration also reveal the dynamics and flexibility of the HA molecules and the sensitivity of attachment for electrostatic effects.

Keywords: Mineral Particles, Polyelectrolyte Adsorption, Light-Scattering, Organic-Matter, Iron-Oxide, Substances, Desorption, Diffusion

Crittenden, J.C., Sanongraj, S., Bulloch, J.L., Hand, D.W., Rogers, T.N., Speth, T.F. and Ulmer, M. (1999), Correlation of aqueous-phase adsorption isotherms. *Environmental Science & Technology*, **33** (17), 2926-2933.

Full Text: [E\Env Sci Tec33, 2926.pdf](E/Env%20Sci%20Tec33,%202926.pdf)

Abstract: A correlation was developed to estimate the adsorption equilibrium capacity of various adsorbents and organic compounds using a combination of Polanyi potential theory and linear solvation energy relationships (LSERs). Polanyi theory provided the basic mathematical form for the correlation. LSERs were used to normalize the Polanyi theory based on the fundamental interaction forces between the solvent, adsorbate, and adsorbent expected in aqueous-phase adsorption. The correlation was developed using 56 organic compounds and eight adsorbents. The following classes of organic compounds were used: (i) halogenated aliphatics, (II) aromatics and halogenated aromatics, (iii) polyfunctional organic compounds and (iv) sulfonated aromatics. The adsorbents were (i) three coal-based activated carbons (F-300, F-400, and APA), (II) one coconut shell based activated carbon (580-26), (iii) one unspecified activated carbon, and (iv) three synthetic polymeric adsorbents (XAD-4, XAD-7, and XEN-563). The proposed correlation, which considers the fundamental solvent-adsorbate-adsorbent interaction forces, showed a significant improvement in predicting the adsorption capacity over a correlation that considered only van der Waals forces. However, the correlations did not predict the adsorption capacities of highly soluble organic compounds such as polysulfonated aromatics and polyfunctional organic compounds.

Keywords: Solvation Energy Relationships, Activated Carbon, GAC, Water

Walker, M.J. and Montemagno, C.D. (1999), Sorption of *Cryptosporidium parvum* oocysts in aqueous solution to metal oxide and hydrophobic substrates. *Environmental Science & Technology*, **33** (18), 3134-3139.

Full Text: [E\Env Sci Tec33, 3134.pdf](E/Env%20Sci%20Tec33,%203134.pdf)

Abstract: The parasite *Cryptosporidium parvum* (C, parvum) may be introduced into water supplies by a number of processes, including runoff and infiltration from areas where wastes from infected hosts are dispersed on soils. Soil particles may attenuate or, when suspended in flow with sufficient kinetic energy, act as transport sites for oocysts. Sorption may also he reversed by the frictional force of flowing water. As a first step toward understanding oocyst attentuation and transport, we examined partitioning in a two-phase, laminar flow microduct. This exposed aqueous suspensions of C. parvum oocysts to metal oxide and hydrophobic substrates (Al2O3. Fe2O3, SiO2, and octadecyltrichlorosilane ((OTS) CH3 (CH2)17SiCl3, a hydrophobic monolayer)) on transparent glass slides. Sorption under laminar flow conditions was observed for unexposed oocysts and oocysts subjected to freeze-thaw cycling and desiccation. The results indicate differences in sorption between substrates and oocyst exposure to stresses. Regardless of exposure to stress, oocysts sorbed to Al2O3 but not to Fe2O3, OTS, and SiO2. of the starting number of oocysts added to the microduct with Al2O3 substrates, 61% of the freeze-thawed, 43% of the desiccated oocysts, and 4% of the unexposed oocysts remained sorbed. The differences may be due to loss of integrity of the oocyst wall and dispersion of nucleic acids within the interior of the oocyst, as indicated by propidium iodide staining of DNA. This suggests that charge-based interactions with colloids may be most pronounced when the oocyst is no longer capable of initiating infection.

Keywords: Water Supplies, Infection, Viability, Outbreak, Survival, *Giardia*, Feces

Hawthorne, S.B., Bjorklund, E., Bøwadt, S. and Mathiasson, L. (1999), Determining PCB sorption/desorption behavior on sediments using selective supercritical fluid extraction. 3. Sorption from water. *Environmental Science & Technology*, **33** (18), 3152-3159.

Full Text: [E\Env Sci Tec33, 3152.pdf](E/Env%20Sci%20Tec33,%203152.pdf)

Abstract: Supercritical fluid extraction (SFE) with pure CO2 was used to quantitatively remove PCBs from historically contaminated sediments without substantially disturbing their bulk organic or inorganic matrix as evidenced by only small or undetectable changes in thermal gravimetric behavior, elemental (C, H, N, S) composition, ionic conductivity, and pH determined before and after SFE. The extracted PCBs were then spiked into water with the parent sediment, and sorption was allowed to occur for up to 18 days. The selective SFE conditions developed in part 1 were used to determine the proportion of PCBs which could be extracted under four conditions of increasing stringency. Comparing the selective SFE behavior of the PCBs from the water/sediment sorption samples to the original historically contaminated sediments demonstrated that 18 days was not sufficient for PCBs to migrate to the “slower” sediment-binding sites (those sites requiring more rigorous SFE conditions), which the PCBs had occupied in the historically contaminated sediments and that the adsorbed PCBs were primarly associated with the binding sites most easily extracted (“rapidly desorbed”) by SFE. Sediment/wafer distribution coefficients at 18 days were similar for sediments with low contamination levels (<50 ng/g of individual congeners) and high contamination levels (similar to 300-4000 ng/g). Apparent distribution coefficients (K(d)s) at 18 days were similar (within a factor of 2) for the various sediments regardless of congener molecular weight or concentration. K(d)s increased by a factor of similar to 4-8 when exposure was increased from 2 h to 18 days, with the most rapidly sorbed molecules corresponding to those molecules most rapidly desorbed by selective SFE.

Keywords: Polycyclic Aromatic-Hydrocarbons, Halogenated Organic-Chemicals, Distributed Reactivity Model, Long-Term Sorption, Polychlorinated-Biphenyls, Contaminated Soils, Aquifer Material, Slow Sorption, Desorption, Kinetics

Pinheiro, J.P., Mota, A.M. and Benedetti, M.F. (1999), Lead and calcium binding to fulvic acids: Salt effect and competition. *Environmental Science & Technology*, **33** (19), 3398-3404.

Full Text: [E\Env Sci Tec33, 3398.pdf](E/Env%20Sci%20Tec33,%203398.pdf)

Abstract: Knowledge of the speciation of Pb in natural aquatic systems is important if we want to understand the bioavailability and mobility of Pb in polluted and natural environments. The results given in this paper were obtained under conditions as close as possible to natural conditions. These new data show that Pb strongly binds to fulvic acids. We also show that the competitive effect of Pb on Ca binding to the same fulvic acid is smaller than the salt effect on Ca binding to fulvic acids as pH varies from 4 to 8. All the data were analyzed with the NICCA-Donnan model developed to describe metal ion binding to natural organic matter. The model predictions of competitive a nd salt effects are excellent. Comparison of our results with previously published data suggests that metal ion binding strength is similar for fulvics acids from different origins. Thus, all data sets could be interpreted within the framework of a unified modeling approach.

Keywords: Metal-Ion Binding, Simple Electrostatic Model, Nica-Donnan Model, Humic Substances, Organic-Matter, Proton Binding, Soils, Spectroscopy, Atmosphere, Adsorption

Chattopadhyay, S. and Puls, R.W. (1999), Adsorption of bacteriophages on clay minerals. *Environmental Science & Technology*, **33** (20), 3609-3614.

Full Text: [E\Env Sci Tec33, 3609.pdf](E/Env%20Sci%20Tec33,%203609.pdf)

Abstract: The ability to predict the fate of microorganisms in soil is dependent on an understanding of the process of their sorption on soil and subsurface materials. Presently, we have focused on studying the thermodynamics of sorption of bacteriophages (T-2, MS-2, and phi X-174) on clays (hectorite, saponite, kaolinite, acid clay fraction of samples collected from a landfill site). The thermodynamic study not only determines the feasibility of the process but also provides information on the relative magnitudes of the different forces under a particular set of conditions. The total free energy of interaction during sorption of bacteriophages on clays (Delta G) has been assumed to be the summation of Delta G(H) (Delta G due to hydrophobic interactions) and Delta G(EL) (Delta G due to electrostatic interactions). The magnitude of Delta G(H) was determined from the different interfacial tensions (gamma) present in the system, while Delta G(EL) was calculated from zeta-potentials of the colloidal particles. Calculated results show that surface hydrophobicities of the selected sorbents and sorbates dictate sorption. Among the selected bacteriophages, maximum sorption was observed with T-2, while hectorite has the maximum sorption capacity. Experimental results obtained from the batch adsorption studies also corroborated those obtained from the theoretical study.

Keywords: Virus Adsorption, Contact Angles, Aqueous-Media, Water, Adhesion, Surfaces, Charge, Energy, Solids, Soils

Lasko, C.L. and Hurst, M.P. (1999), An investigation into the use of chitosan for the removal of soluble silver from industrial wastewater. *Environmental Science & Technology*, **33** (20), 3622-3624.

Full Text: [E\Env Sci Tec33, 3622.pdf](E/Env%20Sci%20Tec33,%203622.pdf)

Abstract: Chitosan was examined as a means of removing soluble silver from industrial waste streams. Stirred-batch and column methods were used to remove free (hydrated) silver ion as well as the ammonia, thiocyanate, thiosulfate, and cyanide complexes of silver in simulated wastewater at an initial concentration of 50 ppm and in a pH range of 2-10. An actual sample of X-ray film development rinse water was also tested. Batch method results show 80-95% silver bound at pH 4-8 for Ag+ and As(NH3)2+, while 92% and 75% of Ag(S2O3)23-and Ag(SCN)32-, respectively, were bound at pH 2. Using a column containing 0.500 g of chitosan, 160 bed volumes of Ag+, 875 bed volumes of Ag(NH3)2+, 715 bed volumes of As(S2O3)23-, and 190 bed volumes of AS(SCN)32-solution were treated before silver ion concentration in the effluent reached 5 ppm. Chitosan did not significantly bind AS(CN)2-at any pH tested. Chitosan treated 450 bed volumes of 40 ppm X-ray rinse water before effluent silver concentration reached 5 ppm. Capacity experiment results using the column method indicated 42 mg of silver bound per gram of chitosan. Four commercial resins, Amberlite IRA-67, IRA 458, IRC-718, and Duolite GT-73, were also tested as silver binding agents.

Keywords: Binding

Nowack, B. and Stone, A.T. (1999), The influence of metal ions on the adsorption of phosphonates onto goethite. *Environmental Science & Technology*, **33** (20), 3627-3633.

Full Text: [E\Env Sci Tec33, 3627.pdf](E/Env%20Sci%20Tec33,%203627.pdf)

Abstract: Mono-and polyphosphonates, which contain R3CP (O) (OH)2 functional groups, are used in an increasing variety of industrial and household applications including cooling water systems, oil production, textile production, and detergents. The main pathway of phosphonate removal in the environment is via adsorption onto surfaces. This study examines the effect of Ca, Cu, Zn, and Fe-III on the adsorption of six phosphonates onto the iron (hydr)oxide goethite. HEDP, NTMP, EDTMP, and DTPMP are commonly used, while AMP and IDMP have been identified as breakdown products of NTMP. When the molar concentration of Ca, Cu, Zn, and Fe-III is equal to the concentration of the phosphonate, the effects on phosphonate adsorption are either negligible or slight. This can be explained by dissociation of the metal-phosphonate complex and separate adsorption of the metal ion and phosphonate onto different surface sites. When Ca and Zn concentrations are added in excess of the phosphonate concentration, considerable increases in adsorption are observed, presumably through ternary surface complex formation and adsorption onto precipitated (hydr)oxides of Zn. Excess Ca concentrations can double the maximum surface coverage of NTMP. Phosphonate adsorption at low pH deposits negative charge on (hydr)oxide surfaces and hence increases Cu adsorption through favorable long-range electrostatic interactions. The results are discussed with respect to the removal of phosphonates in natural systems. The presence of di-and trivalent metals is not expected to diminish the removal of phosphonate during wastewater treatment or in natural waters contrary to aminocarboxylates such as EDTA where most metals result in a reduction of EDTA adsorption. Optimal phosphonate removal can be expected in waters containing mM Ca and employing addition of iron salts for flocculation or phosphate elimination.

Keywords: Waste-Water Treatment, EDTA Complexes, Systems, Surface, Model, NTA, Ethylenediaminetetraacetate, Speciation, Phosphate, Oxides

Schiewer, S. and Wong, M.H. (1999), Metal binding stoichiometry and isotherm choice in biosorption. *Environmental Science & Technology*, **33** (21), 3821-3828.

Full Text: [E\Env Sci Tec33, 3821.pdf](E/Env%20Sci%20Tec33,%203821.pdf)

Abstract: Seaweeds that possess a high metal binding capacity may be used as biosorbents for the removal of toxic heavy metals from wastewater. The binding of Cu and Ni by three brown algae (*Sargassum*, Colpomenia, Petalonia) and one green alga (Ulva) was investigated at pH 4.0 and pH 3.0. The greater binding strength of Cu is reflected in a binding constant that is about 10 times as high as that of Ni. The extent of metal binding followed the order Petalonia similar to *Sargassum* > Colpomenia > Ulva. This was caused by a decreasing number of binding sites and by much lower metal binding constants for Ulva as compared to the brown algae. Three different stoichiometric assumptions are compared for describing the metal binding, which assume either that each metal ion M binds to one binding site B forming a BM complex or that a divalent metal ion M binds to two monovalent sites B forming BM0.5 or B2M complexes, respectively. Stoichiometry plots are proposed as tools to discern the relevant binding stoichiometry. The pH effect in metal binding and the change in proton binding were well predicted for the B2M or BM0.5 stoichiometries with the former being better for Cu and the latter preferable for Ni. Overall, the BM0.5 model is recommended because it avoids iterations.

Keywords: Ion-Exchange, Adsorption, Protons, Cu(II)

Paulson, A.J. and Balistrieri, L. (1999), Modeling removal of Cd, Cu, Pb, and Zn in acidic groundwater during neutralization by ambient surface waters and groundwaters. *Environmental Science & Technology*, **33** (21), 3850-3856.

Full Text: [E\Env Sci Tec33, 3850.pdf](E/Env%20Sci%20Tec33,%203850.pdf)

Abstract: Removal of Pb, Cu, Zn, and Cd during neutralization of acid rock drainage is examined using model simulations of field conditions and laboratory experiments involving mixing of natural drainage and surface waters or groundwaters. The simulations consider sorption onto hydrous Fe and Al oxides and particulate organic carbon, mineral precipitation, and organic and inorganic solution complexation of metals for two physical systems where newly formed oxides and particulate organic matter are either transported or retained along the chemical pathway. The calculations indicate that metal removal is a strong function of the physical system. Relative to direct discharge of ARD into streams, lower metal removals are observed where ARD enters streamwaters during the latter sta ges of neutralization by ambient groundwater after most of the Fe has precipitated and been retained in the soils. The mixing experiments, which represent the field simulations, also demonstrated the importance of dissolved metal to particle Fe ratios in controlling dissolved metal removal along the chemical pathway. Finally, model calculations indicate that hydrous Fe oxides and particulate organic carbon are more important than hydrous Al oxides in removing metals and that both inorganic and organic complexation must be considered when modeling metal removal from aquatic systems that are impacted by sulfide oxidation.

Keywords: Mine Drainage, Humic Substances, Mining District, Organic-Matter, Iron-Oxides, Adsorption, Transport, Sediments, Sorption, Colorado

Christensen, J.B. and Christensen, T.H. (1999), Complexation of Cd, Ni, and Zn by DOC in polluted groundwater: A comparison of approaches using resin exchange, aquifer material sorption, and computer speciation models (WHAM and MINTEQA2). *Environmental Science & Technology*, **33** (21), 3857-3863.

Full Text: [E\Env Sci Tec33, 3857.pdf](E/Env%20Sci%20Tec33,%203857.pdf)

Abstract: Complexation of cadmium (Cd), nickel (Ni), and zinc (Zn) by dissolved organic carbon (DOC) in leachate-polluted groundwater was measured using a resin equilibrium method and an aquifer material sorption technique. The first method is commonly used in complexation studies, white the second method better represents aquifer conditions. The two approaches gave similar results. Metal-DOC complexation was measured over a range of DOC concentrations using the resin equilibrium method, and the results were compared to simulations made by two speciation models containing default databases on metal-DOC complexes (WHAM and MINTEQA2). The WHAM model gave reasonable estimates of Cd and Ni complexation by DOC for both leachate-polluted groundwater samples.: The estimated effect of complexation differed less than 50% from the experimental values corresponding to a deviation on the activity of the free metal ion of a factor of 2.5. The effect of DOC complexation for Zn was largely overestimated by the WHAM model, and it was found that using a binding constant of 1.7 instead of the default value of 1.3 would improve the fit between the simulations and experimental data. The MINTEQA2 model gave reasonable predictions of the complexation of Cd and Zn by DOG, whereas deviations in the estimated activity of the free Ni2+ ion as compared to experimental results are up to a factor of 5.

Keywords: Dissolved Organic-Carbon, Humic Substances, Fulvic-Acids, Ion-Binding, Cadmium, Zinc

Yang, J. and Volesky, B. (1999), Modeling the uranium-proton ion exchange in biosorption. *Environmental Science & Technology*, **33** (22), 4079-4085.

Full Text: [E\Env Sci Tec33, 4079.pdf](E/Env%20Sci%20Tec33,%204079.pdf)

Abstract: Biosorption of uranium metal ions by a nonliving protonated *Sargassum* fluitans seaweed biomass was used tea remove the heavy metal uranium from the aqueous solution. Uranium biosorption isotherms were established for solution pH values ranging from pH 2.5-4.0. Uranium biosorption uptake was accompanied by the release of protons from the biomass. The sorption isotherms were highly pH dependent, and the metal binding increased significantly with increasing pH values. Above pH 3.0, the maximum uranium uptakes exceeded the total biomass binding capacity as expressed in equivalents units. A mathematical model based on the ion exchange between protons in the biomass and hydrolyzed uranium ion species was developed. Given the total uranium concentration and pH value, the model can calculate the uranium and proton binding as well as the composition of uranium ionic groups in the solution and on the biosorbent. The model was capable of fitting and predicting biosorption isotherms for different pH values as well as the equilibrium uranium desorption concentrations.

Keywords: Algae, Bioaccumulation, Biotechnology, Metals

Walcarius, A., Devoy, J. and Bessiere, J. (1999), Electrochemical recognition of selective mercury adsorption on minerals. *Environmental Science & Technology*, **33** (23), 4278-4284.

Full Text: [E\Env Sci Tec33, 4278.pdf](E/Env%20Sci%20Tec33,%204278.pdf)

Abstract: Mercury species are highly toxic contaminants of the environment, and their dissemination in aquatic media is governed by sorption processes on both organic (including biological) and inorganic particles. An electrochemical method is provided for the direct monitoring of the selective binding of inorganic mercury(II) to the surface hydroxyl groups of some minerals (silica, goethite, pyrite) by using carbon paste electrodes modified by these mineral particles. After accumulation from aqueous solutions at open circuit, anodic stripping voltammetry was performed with the electrode immersed in a detection cell containing typically 0.2 M HNO3 in order to desorb and measure the amount of previously adsorbed mercury. Several experimental parameters were optimized with a silica-modified electrode to ensure quantitative and reproducible results, including the electrode composition, the accumulation time, and the voltammetric detection mode. Mercury adsorption was studied as a function of pH and chloride concentration. It was found that only the soluble mercury(II) species with hydroxyl moieties (HgOH+, Hg(OH)2, HgOHCl) were able to adsorb an these minerals by reacting with their surface hydroxyl groups. Moreover, in a rather law pH region (4-7), this reaction was extremely selective for mercury over other soluble metal species. The electrochemical monitoring, though mainly controlled by kinetics, gave significant insight in the adsorption processes as far as equilibrium states were rapidly reached.

Keywords: Zeolite-Modified Electrodes, Industrial Wastewaters, Chloride Concentration, Carbon-Paste, Goethite, Exchange, Surface, Hg(II), Water, Soil

Notes: highly cited

? Buerge, I.J. and Hug, S.J. (1999), Influence of mineral surfaces on chzromium(VI) reduction by iron(II). *Environmental Science & Technology*, **33** (23), 4285-4291.

Full Text: [1999\Env Sci Tec33, 4285.pdf](1999/Env%20Sci%20Tec33,%204285.pdf)

Abstract: Chromium(VI) is a priority pollutant of some soils and natural waters in industrial areas. Iron(II), an important natural reductant of Cr(VI), is an option in remediation of contaminated sites, transforming Cr(VI) to essentially nontoxic Cr(III). After kinetics and pathways of this redox reaction had been reported to depend strongly on pH and organic ligands, this study investigated the influence of mineral surfaces. Kinetic measurements with UV-vis in mineral and sail suspensions at pH 5 showed that all minerals tested, except Al2O3, accelerated the Cr(VI) reduction by Fe(II), in the order of alpha-FeOOH approximate to gamma-FeOOH much greater than montmorillonite > kaolinite approximate to SiO2 much greater than Al2O3. Similar kinetics were observed with soil from the E and Bw horizons of a Podzol. The reactions appear to be driven by the high reactivity of adsorbed Fe(II). Whereas adsorbed Cr(VI) was reducible by Fe(II), the sparingly soluble BaCrO4 was largely protected from reduction. This is of environmental relevance since in many polluted soils, Cr(VI) is partly present as Pa, Ca, Fe, or Pb salts. Kinetic data and reaction pathways are important in the optimization of Fe(II)/mineral mixtures as reductants of Cr(VI) in technical systems, in the evaluation of insitu remediation of Cr(VI)-contaminated waters and sails by Fe(II), and in qualitative predictions and modeling of Cr(VI) in natural systems.

Keywords: Adsorption, Aqueous-Solutions, Chromate Reduction, Hexavalent Chromium, Kinetics, Montmorillonite, Oxidation-Reduction, Remediation, Soils, Sorption, Spectroscopy, Subsurface Remediation

Li, Z., Jones, H.K., Bowman, R.S. and Helferich, R. (1999), Enhanced reduction of chromate and PCE by pelletized surfactant-modified zeolite/zerovalent iron. *Environmental Science & Technology*, **33** (23), 4326-4330.

Full Text: [E\Env Sci Tec33, 4326.pdf](E/Env%20Sci%20Tec33,%204326.pdf)

Abstract: The current research focuses on enhanced removal of chromate and perchloroethylene from contaminated water by a combination of a reduction material (represented by zerovalent iron, ZVI) and a sorption material (represented by surfactant-modified zeolite, SMZ). Natural zeolite and ZVI were homogenized and pelletized to maintain favorable hydraulic properties while minimizing material segregation due to bulk density differences. The zeolite/ZVI pellets were modified with the cationic surfactant hexadecyltrimethylammonium bromide to increase contaminant sorption and, thus, the contaminant concentration on the solid surface. Results of chromate sorption/reduction indicate that the chromate sorption capacity of pelletized SMZ/ZVI is at least 1 order of magnitude higher than that of zeolite/ ZVI pellets. Compared to SMZ pellets, the chromate removal capacity of SMZ/ZVI pellets in a 24-h period is about 80% higher, due to the combined effects of sorption by SMZand reduction by ZVI. The chromate and PCE degradation rates with and without surfactant modification were determined separately. The pseudo-first-order reduction constant increased by a factor of 3 for PCE and by a factor of 9 for chromate following surfactant modification. The enhanced contaminant reduction capacity of SMZ/ZVI pellets may lead to a decrease in the amount of material required to achieve a given level of contaminant removal.

Tang, J.X., Robertson, B.K. and Alexander, M. (1999), Chemical-extraction methods to estimate bioavailability of DDT, DDE, and DDD in soil. *Environmental Science & Technology*, **33** (23), 4346-4351.

Full Text: [E\Env Sci Tec33, 4346.pdf](E/Env%20Sci%20Tec33,%204346.pdf)

Abstract: A study was conducted to find a method to determine the bioavailability to earthworms of DDT, DDE, and DDD in soils. Measurements were made of the uptake by Eisenia foetida of the three compounds in seven soils in which they were freshly added or had persisted in the field for up to 49 yr. The worms assimilated 3.15-66.2% of the compounds in the test samples. Different amounts of the three compounds were sorbed by C18 membrane disks placed in suspensions of these soils, and different amounts also were extracted by solutions of tetrahydrofuran in water. The amounts of the compounds taken up by the C18 membrane disks and extracted by the tetrahydrofuran -water mixture correlated well with uptake by E. foetida from 10 samples of these soils. The correlation coefficients (r) were 0.921 or higher for the C18 membrane disk assay and 0.831-0.948 for the tetrahydrofuran-extraction assay in correlations of the chemical and biological assays. These methods thus offer promise as chemical assays to predict bioavailability of DDT and related compounds.

Keywords: Solid-Phase Extraction, Equilibrium Partitioning Theory, Organic-Chemicals, Acute Toxicity, Persistence, Water, Sequestration, Contamination, Pesticides, Sediments

Papini, M.P., Kahie, Y.D., Troia, B. and Majone, M. (1999), Adsorption of lead at variable pH onto a natural porous medium: Modeling of batch and column experiments. *Environmental Science & Technology*, **33** (24), 4457-4464.

Full Text: [E\Env Sci Tec33, 4457.pdf](E/Env%20Sci%20Tec33,%204457.pdf)

Abstract: The surface complexation approach has been applied to describe the adsorption of lead and proton onto a heterogeneous natural porous medium (red pozzolan) at constant ionic strength (0.1 mol L-1). Acid-base titration experiments were used to determine the minimum number of sites needed to describe the surface heterogeneity. Lead adsorption tests at several pH and total lead concentration were used to complete the model structure, whose adjustable parameters (site concentrations and apparent formation constants) were determined by nonlinear multivariate regression of titration and adsorption data. The final model represents the acid-base properties of the surface by the presence of two amphoteric sites, SOH and TOH, and a monoprotic one, MOH, whereas lead adsorption is considered only onto SOH and MOH sites. The model allows a good representation of the experimental behavior in the whole experimental range (pH = 4-10 for titration, pH = 3.5-6.0 and total lead concentration from 8.8×10-5 to 7.3×10-4 mol L-1 for adsorption experiments). Theoretical surface speciation shows that lead adsorption occurs mostly onto site MOH at low pH level and on both SOH and MOH sites at higher values.: The model was independently validated by simulating pH and pH breakthrough experiments performed in small chromatrographic columns. Experimental breakthroughs are well predicted by an advection-dispersion transport model coupled with the chemical equilibrium routine (IMPACT), without any parameter adjustment. A large spreading of Pb and pH breakthroughs was calculated and experimentally observed, even in the absence of any kinetic effect. That spreading is explained in terms of the concomitant presence of competitive adsorption and surface heterogeneity.

Keywords: Surface Complexation Model, Heterogeneous Surfaces, Cation Adsorption, Transport, Sorption, Isotherms, Sediments, Sorbents, Systems

Small, T.D., Warren, L.A., Roden, E.E. and Ferris, F.G. (1999), Sorption of strontium by bacteria, Fe(III) oxide, and bacteria-Fe(III) oxide composites. *Environmental Science & Technology*, **33** (24), 4465-4470.

Full Text: [E\Env Sci Tec33, 4465.pdf](E/Env%20Sci%20Tec33,%204465.pdf)

Abstract: This study provides the first quantitative comparison of the sorptive capacities of a bacteria-fe oxide composite to its individual components. These results have enormous significance for understanding the fate and transport of inorganic contaminants in natural aqueous environments where heterogeneous bacteria-oxide composite solids are commonly found. We quantify Sr2+ sorption to the bacteria Shewanella alga, Shewanella putrefaciens, amorphous hydrous ferric oxide (HFO), and S. alga coated with HFO over a range of total Sr2+ concentrations (0.005-10 mM) and pH (2.5-11 at 0.5 pH increments) under well controlled laboratory conditions. Significant Sr2+ sorption occurred at significantly lower pH values to the bacteria and S. alga-HFO composite (5.5-5.9) compared to HFO (7.6). Geochemical modeling using a generalized Langmuir equation showed that the bacteria sorb significantly greater quantities of Sr2+ (maximum sorptive capacity: BSrmax = 0.079 and 0.075 mmol g-1 for S, alga and S. putrefaciens, respectively) than the HFO (0.001 mmol g-1). The observed BSrmax for the S. alga-HFO composite (0.034 mmol g-1) was less than the combined sorptive properties of its components (BSrmax = 0.041 mmol g-1), likely reflecting HFO masking of bacterial surface binding sites.

Keywords: Surface Complexation Model, Metal Adsorption, Shewanella-Alga, Ionic-Strength, Trace-Metals, Iron, pH, Precipitation, Manganese, Sediment

Vile, M.A., Wieder, R.K. and Novak, M. (2000), 200 years of Pb deposition throughout the Czech Republic: Patterns and sources. *Environmental Science & Technology*, **34** (1), 12-21.

Full Text: [E\Env Sci Tec34, 12.pdf](E/Env%20Sci%20Tec34,%2012.pdf)

Abstract: Historical rates of Pb deposition were determined over the past 150-200 years for eight sites throughout the Czech Republic using Pb-210-dated, Sphagnum-derived peat cores. Maximum historical Ph deposition was greater at sites in the northern and western parts of the Czech Republic than at sites in the southern part of the Czech Republic (peak values averaging 57, 21, and 16 mg m-2 yr-1, respectively). Lead deposition patterns generally reflect increasing industrialization over the past 100-200 years, especially in the post-We rid War II era. For seven of the eight sites, maximum Pb deposition occurred between 1965 and 1992, corresponding to a period of peak production and burning of lignite coal. A decrease in Ph deposition rates since 1975-1980 was evident in seven of the sites. The most recent Pb deposition rates (1992), estimated from the uppermost peat core sections, averaged 32, 11, and 7 mg m-2 yr-1 for the northern, western, and southern sites, respectively, are higher than current Pb deposition in the eastern United States of 4 mg m-2 yr-1. Lead deposition rates prior to Czech industrialization, estimated from the deepest dateable peat core sections, averaged 8, 5, and 1 mg m-2 yr-1 for the northern, western, and southern sites, respectively. Using acid-insoluble ash concentrations in peat and peat magnetic susceptibility determinations, we were able to identify past periods of elevated Pb deposition related to local mining of Pb-containing ore deposits at three of the sites and periods of elevated Pb deposition from fossil fuel combustion at five of the sites. Without stable Pb isotopic determinations, the importance of lead ed gasoline-derived pH could not be determined.

Keywords: Atmospheric Deposition, Water Chemistry, Central-Europe, Peat Bogs, Lead, Elements, Copper, Czechoslovakia, Environment, Pollution

Liu, W., Vidic, R.D. and Brown, T.D. (2000), Impact of flue gas conditions on mercury uptake by sulfur-impregnated activated carbon. *Environmental Science & Technology*, **34** (1), 154-159.

Full Text: [E\Env Sci Tec34, 154.pdf](E/Env%20Sci%20Tec34,%20154.pdf)

Abstract: Novel sulfur-impregnated activated carbons (SIACs) have shown excellent mercury uptake capacity when pure nitrogen was used as a carrier gas. This study investigated the impact of various gas constituents found in a real flue gas on the performance of SIACs. Fixed-bed adsorber tests showed that CO2 (up to 15%) had no impact on mercury uptake by SIAC, while the presence of O2 (up to 9%) increased the adsorptive capacity up to 30%. Increase in the amount of oxygen-containing acidic surface functional groups had no impact on mercury uptake, and it is postulated that the enhanced performance was due to the formation of HgO catalyzed by SIAC. Moisture presence (up to 10%) can decrease SIAC’s capacity for mercury uptake by as much as 25% due to competitive adsorption and additional internal mass transfer resistance. SO2 (1600 ppm) and NO (500 ppm) exhibited no impact on mercury uptake by SIAC even in the presence of 10% moisture. Adsorptive capacity of SIAC decreased significantly when the reaction temperature increased from 140 to 250 and 400°C due to the pronounced exothermic nature of HgS formation, but increasing the empty-bed contact time can partially offset this loss of capacity.

Keywords: Phase Mercury, Power-Plants, Adsorption, Surface, Vapor

Gullett, B.K., Dunn, J.E. and Raghunathan, K. (2000), Effect of cofiring goal on formation of polychlorinated dibenzo-p-dioxins and dibenzofurans during waste combustion. *Environmental Science & Technology*, **34** (2), 282-290.

Full Text: [E\Env Sci Tec34, 282.pdf](E/Env%20Sci%20Tec34,%20282.pdf)

Abstract: The effect of cofiring coal with municipal waste on formation of polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) was examined by cofiring minor amounts (<7% by wt) of high (3.4% by wt) or low (0.7% by wt) sulfur (S) coal in a municipal waste combustor. PCDD/F concentrations were reduced up to 80% during the 13-run, 6-day effort. Both current and past operating conditions (fuel type and rate, gas concentrations) had an effect on current levels of PCDD/F formation. The influence of past conditions is consistent with a PCDD/F formation mechanism involving combustor wall deposits as sites for formation and indicates that PCDD/F measurements on field units may be affected in part by past operating conditions, at least up to 6 h. These wall deposits act as sources and receptors of PCDD/F precursors, reactants, and/ or catalysts. it is proposed that an effect of higher sulfur dioxide concentration from cofiring coal is to displace the sulfate/chforide equilibrium in the deposits, thereby decreasing chlorine contact with active sites and/or reducing catalytic activity through formation of metal sulfates rather than metal chlorides. PCDD versus PCDF levels were affected by mostly different operating parameters, suggesting that their mechanisms of formation are somewhat distinct.

Keywords: De-Novo Synthesis, Municipal Waste, Fly-Ash, Sulfur, Incineration, Systems, Coal

Sauvé, S., Norvell, W.A., McBride, M. and Hendershot, W. (2000), Speciation and complexation of cadmium in extracted soil solutions. *Environmental Science & Technology*, **34** (2), 291-296.

Full Text: [E\Env Sci Tec34, 291.pdf](E/Env%20Sci%20Tec34,%20291.pdf)

Abstract: We report the soil solution speciation of Cd in 64 field-collected contaminated soils containing between 0.1 and 38 mg Cd kg-1. The soils were analyzed for pH (3.5-8.1), soil organic matter (8.0-108 g C kg-1), total dissolved Cd (0.03-182 µ Cd L-1), dissolved organic carbon (1.5-12 mg C L-1), and free Cd2+ (10-1-2×10-7 M). Free Cd2+ activity in solution was determined using differential pulse anodic stripping voltammetry (DPASV), assuming DPASV is sensitive to easily dissociated inorganic ion-pairs and free Cd2+ while excluding organic complexes. The solid/liquid partition coefficient(K-d) varied over a range from 10 to 100 000, and the fraction of the dissolved Cd present in solution as the estimated free Cd2+ species varied between 0 and 60% but averaged about 20%. The dissolved concentrations of Cd and the free Cd2+ activity in the soil solutions of contaminated soils of different origins can be predicted with reasonable accuracy using a simple competitive adsorption model dependent on pH and total metal loading.

Keywords: Contaminated Soils, Partition-Coefficients, Chemical Speciation, Quality Criteria, Organic-Matter, Sewage-Sludge, Heavy-Metals, Trace-Metals, Swiss-Chard, Sorption

Notes: highly cited

? Karapanagioti, H.K., Kleineidam, S., Sabatini, D.A., Grathwohl, P. and Ligouis, B. (2000), Impacts of heterogeneous organic matter on phenanthrene sorption: Equilibrium and kinetic studies with aquifer material. *Environmental Science & Technology*, **34** (3), 406-414.

Full Text: [2000\Env Sci Tec34, 406.pdf](2000/Env%20Sci%20Tec34,%20406.pdf)

Abstract: Sediment organic matter heterogeneity in sediments is shown to impact the sorption behavior of contaminants. We investigated the sorptive properties as well as the composition of organic matter in different subsamples (mainly grain size fractions) of the Canadian River Alluvium (CRA). Organic petrography was used as a new tool to describe and characterize the organic matter in the subsamples. The samples studied contained many different types of organic matter including bituminous coal particles, Differences in sorption behavior were explained based on these various types of organic matter. Subsamples containing predominately coaly, particulate organic matter showed the highest K-oc, the highest nonlinearity of sorption isotherms and the slowest sorption kinetics. Soil subsamples with organic matter present as organic coatings around the quartz grains evidenced the lowest K-oc, the most linear sorption isotherms and the fastest sorption kinetics, which was not limited by slow intraparticle diffusion. Due to the high sorption capacity of the coaly particles even when it is present as only a small fraction of the composite organic content (<3%) causes K-oc values which are much higher than expected for soil organic matter (e.g. K-oc - K-ow relationships). The results show that the identification and quantification of the coaly particles within a sediment or soil sample is a prerequisite in order to understand or predict sorption behavior of organic pollutants.

Keywords: Aquifer Material, Behavior, Capacity, Coatings, Composite, Diffusion, Equilibrium, Identification, Intraparticle Diffusion, Isotherms, Kinetic, Kinetic Studies, Kinetics, Organic Matter, Organic Pollutants, Particles, Pollutants, Sediment, Size, Small, Soil, Soil Organic Matter, Sorption, Sorption Capacity, Sorption Isotherms, Sorption Kinetics

Zhu, L.Z., Chen, B.L. and Shen, X.Y. (2000), Sorption of phenol, p-nitrophenol, and aniline to dual-cation organobentonites from water. *Environmental Science & Technology*, **34** (3), 468-475.

Full Text: [E\Env Sci Tec34, 468.pdf](E/Env%20Sci%20Tec34,%20468.pdf)

Abstract: A series of dual-cation organobentonites are synthesized by replacing the metal ions in bentonite with both long-chain alkyl quaternary ammonium cations, such as dodecyltrimethylammonium (DTMA), benzyldimethyltetradecylammonium (BDTDA), cetyltrimethylammonium (CTMA), octodecyltrimethylammonium (OTMA), and short-chain alkyl quaternary ammonium cations, such as tetramethylammonium (TMA). The influential factors, mechanisms and characteristics of polar and ionizable organic contaminants, such as p-nitrophenol, phenol, and aniline, and sorption to dualcation organobentonites from water are investigated systematically and described quantitatively. The sorption properties are affected by treatment conditions, such as pH, amount of organobentonite, and shaking time, structure of organobentonites, such as interlayer spacings and organic carbon contents, and the properties of organic compounds, such as solubility and octanol-water coefficient partition. Sorption isotherms of p-nitrophenol, phenol, and aniline are typically nonlinear. Both adsorption and partition contribute to the sorption of organic compounds to dual-cation organobentonites. The separate contributions of adsorption and partition to the total sorption of organic compounds to dual-cation organobentonites are analyzed mathematically, e.g., Q(A) = a ln C-e + b-K-oc. f(oc). C-e, Q(p) = K-oc. f(oc .)C(e). Results indicate that the partition effect is weak and linear to contaminant concentration, whereas adsorption effect is more powerful and nonlinear to contaminant concentration. The sorption of organic compounds to dual-cation organobentonite is dominated by adsorption at low concentrations and by partition at high concentrations, making the organobentonites powerful sorbents for organic contaminants over a wide range of concentrations.

Keywords: Organic Contaminants, Adsorption, Clay, Smectite, Soils, Pentachlorophenol, Groundwater, Surfaces

Rectenwald, L.L. and Drenner, R.W. (2000), Nutrient removal from wastewater effluent using an ecological water treatment system. *Environmental Science & Technology*, **34** (3), 522-526.

Full Text: [E\Env Sci Tec34, 522.pdf](E/Env%20Sci%20Tec34,%20522.pdf)

Abstract: This study investigated the use of a periphyton-fish system for removal of phosphorus and nitrogen from treated wastewater. In the periphyton-fish system, water flows through a series of vessels, and nutrients are taken up by periphyton growing on screens. Algal-grazing fish feed on the periphyton and either assimilate the nutrients into fish tissue or egest the nutrients in mucus-bound feces that settle from the water into a sediment trap. Both the fish and their feces can be harvested as nutrient sinks. To test this concept, effluent was pumped from a final clarifier at a wastewater treatment facility through a series of twelve 375-L mesocosms, each containing screens for periphyton growth and an average of 161 g of Tilapia mossambica, an algal-grazing cichlid. The system removed nutrients at an average rate of 27 mg of total phosphorus (TP) m-2 d-1 and 108 mg of total nitrogen (TN) m-2 d-1 and reduced wastewater TP and TN by 82 % and 23 %, respectively.

Keywords: Phosphorus, Nitrogen, Phytoplankton, Periphyton, Digestion, Dominance, Recovery, Algae, Lakes

Wikström, E. and Marklund, S. (2000), Secondary formation of chlorinated dibenzo-p-dioxins, dibenzofurans, biphenyls, benzenes, and phenols during MSW combustion. *Environmental Science & Technology*, **34** (4), 604-609.

Full Text: [E\Env Sci Tec34, 604.pdf](E/Env%20Sci%20Tec34,%20604.pdf)

Abstract: The aim of this study was to investigate how the levels and homologue profiles of organic micropollutants (OMPs) were effected by the so-called secondary formation between 650 and 200°C. The combustion experiments were performed in a laboratory scale reactor fed with an artificial municipal solid waste fuel. The predominance of higher chlorinated OMP homologues after the secondary reaction shows that further chlorination reactions of OMPs formed at higher temperature reactions (>650°C) are more important in the lower temperature range than formation through the elements C, H, O, and Cl (De Novo synthesis). Most of the dibenzofuran (DF), dibenzo-p-dioxin (DD), and the biphenyl (BP) are formed at temperatures higher than 650°C. Simultaneously flue gas sampling was taken in the convector section of the reactor at 650 and 200°C, respectively. The samples were analyzed for monoto octachlorinated dibenzo-p-dioxins and dibenzofurans, tetra- to decachlorinated biphenyls, di- to hexachlorinated benzenes, and di- to pentachlorinated phenols. In addition to chlorinated OMPs, nonchlorinated DD, DF, and BP were analyzed.

Keywords: Municipal Solid-Waste, Incinerator Fly-Ash, Fluidized-Bed Reactor, De-Novo-Synthesis, Pilot Incinerator, PCDD, Decomposition, Mechanism, PCDD/PCDF

Mirimanoff, N. and Wilkinson, K.J. (2000), Regulation of Zn accumulation by a freshwater gram-positive bacterium (*Rhodococcus opacus*). *Environmental Science & Technology*, **34** (4), 616-622.

Full Text: [E\Env Sci Tec34, 616.pdf](E/Env%20Sci%20Tec34,%20616.pdf)

Abstract: Zn uptake by an aquatic Gram-positive bacterium was not predicted by the activity of Zn2+ in the bulk solution. The failure of the simple Free ion Activity Model did not appear to be due to a mass transfer limitation of the uptake process. Instead, Rhodococcus opacus is shown to produce a small (<3 kDa), complexing ligand capable of rapidly reducing [Zn2+] concentrations in the external medium. Furthermore, organism-mediated modifications of the Zn efflux rate and modifications of the internalization rate suggest a metal uptake system that is highly responsive to trace metal concentrations in the medium. Purely chemical explanations we re not sufficient to predict Zn uptake fluxes, instead resistance mechanisms activated by the bacteria in the presence of Zn appeared to be in large part responsible for an important biological control of the Zn accumulation.

Keywords: In-Situ Measurements, Metallothionein Locus, Alcaligenes-Eutrophus, Metal Resistance, Coastal Diatom, Natural-Waters, Zinc, Cadmium, Transport, Protein

Cornelissen, G., van Noort, P.C.M., Nachtegaal, G. and Kentgens, A.P.M. (2000), A solid-state fluorine-NMR study on hexafluorobenzene sorbed by sediments, polymers, and active carbon. *Environmental Science & Technology*, **34** (4), 645-649.

Full Text: [E\Env Sci Tec34, 645.pdf](E/Env%20Sci%20Tec34,%20645.pdf)

Abstract: In sediments, distinct fractions of compound desorbing at different rates are encountered. These fractions desorb rapidly (desorption rate constants similar to 10-1 h-1), slowly (similar to 10-3 h-1), or very slowly (10-5-10-4 h-1). The source of dissimilarity between kinetically different sorbate fractions in sediment has been investigated. Sediments with hexafluorobenzene (HFB) at either rapidly or (slowly + very slowly) desorbing sites were subjected to solid-state MAS F-19 NMR measurements. Active carbon, glassy polystyrene, and rubbery polyacetal with sorbed HFB were also tested, to establish possible similarities between sediments and model sorbents. HFB in sediment at rapidly desorbing sites showed a resonance at-125.5 ppm relative to CFCl3, whereas HFB at slowly desorbing sites showed a resonance at-165.6 ppm. We did not observe an NMR signal for the HFB fraction at very slowly desorbing sites, probably because the amounts of this fraction were too small. The observations indicate that the kinetically different fractions are probably present in different (physicochemical) environments in the sediment. The lines observed for both rapidly and slowly desorbing HFB were relatively narrow (similar to 1.5 and similar to 3 ppm, respectively), indicating that the molecules in both fractions are sorbed in a fairly homogeneous way. However, the exact explanation of the chemical shifts and line widths in terms of sorption mechanisms remains unclear. Similar to the sediment samples, polystyrene and active carbon also show two populations of sorbed HFB, whereas we observe only one population in polyacetal. In the active carbon sample one F-19 chemical shift clearly deviates from the ones in sediment (-176.6 ppm), whereas the other active carbon signal is similar to sediment (-125.5 ppm). The chemical shift of HFB in polyacetal is-167.2 ppm. The chemical shifts of the two fluorine signals of HFB in polystyrene are comparable to the ones for sediment(-163.9 and-125.5 ppm, respectively), supporting the hypothesis that sediment organic matter is a nanoporous material similar to a glassy polymer.

Keywords: Distributed Reactivity Model, Organic-Compounds, Humic Substances, Desorption-Kinetics, Aquifer Material, Sorption, Soils, Time, Hydrocarbons, Spectroscopy

Morrison, D.E., Robertson, B.K. and Alexander, M. (2000), Bioavailability to earthworms of aged DDT, DDE, DDD, and dieldrin in soil. *Environmental Science & Technology*, **34** (4), 709-713.

Full Text: [E\Env Sci Tec34, 709.pdf](E/Env%20Sci%20Tec34,%20709.pdf)

Abstract: A study was conducted to determine the bioavailability of several pesticides that have persisted for various periods in soils in the field and the laboratory. Based on the concentrations or the percentages of the compound in soil samples that were found in the earthworm Eisenia foetida, ca. 30, 12, 34, and 20% of DDT, DDE, DDD, and a total of the three compounds were bioavailable in a soil treated in the field with DDT 49 years earlier. Only 28 or 43% of dieldrin aged for 49 years was bioavailable based on concentrations in E, foetida or percentages of the compound assimilated by the worms, respectively. Comparably low percentages of DDT, DDE, and DDD but not dieldrin were assimilated by the worms from samples of soil from a waste-disposal site receiving the insecticide ca. 30 years earlier. Aging for 190 days in Kendaia loam in the laboratory markedly reduced the availability to E. foetida of DDT and DDE but not DDD. The amounts of aged or unaged DDT, DDE, and DDD but not dieldrin that were removed from the soils by solid-phase extraction with Tenax TA beads were generally greater with increasing amounts assimilated by the earthworms. The results show that aging markedly reduces the bioavailability of these compounds.

Keywords: Polycyclic Aromatic-Hydrocarbons, Equilibrium Partitioning Theory, Desorption-Kinetics, Organic-Compounds, Persistence, Sequestration, Toxicity

Mamontov, A.A., Mamontova, E.A., Tarasova, E.N. and McLachlan, M.S. (2000), Tracing the sources of PCDD/Fs and PCBs to Lake Baikal. *Environmental Science & Technology*, **34** (5), 741-747.

Full Text: [E\Env Sci Tec34, 741.pdf](E/Env%20Sci%20Tec34,%20741.pdf)

Abstract: Lake Baikal is a unique freshwater ecosystem that has been declared a UNESCO World Heritage Site. It contains high levels of PCBs, and Baikal seal were recently found to have PCDD/F concentrations comparable to those in the Baltic Sea. In this work fish and soil were analyzed to trace the sources of these compounds to the lake. The fish samples indicated that the PCDD/F and PCB contamination of Lake Baikal does not originate from background inputs and that the contamination increases from north to south. The soil inventory (quantity of chemical per m(2) ground) was determined at 34 sites around Lake Baikal and in the Angara River valley. For the PCDD/Fs and most PCBs, the soil inventory is a good approximation of the cumulative atmospheric deposition. It varied over a factor of 1000, with the highest levels in Usol’ye Sibirskoe, a city 110 km north of the southwestern tip of the lake in the highly industrialized Angara River valley, and the lowest values in the pristine areas to the northeast of the lake. A continuous decrease in the soil inventory was observed moving from Usol’ye S. up the Angara River valley to Lake Baikal and from there northeastward along the lake. This indicates that there was a major atmospheric source of these compounds in the Usol’ye area. The cumulative deposition to the lake was estimated to be 1.2 kg of TEQ (PCDD/F + PCB). The cumulative deposition of Sigma PCB to Lake Baikal was comparable to the Sigma PCB inventory in Lake Superior in 1986, indicating that the atmospheric emissions in the Usol’ye S, area have been a major source to Lake Baikal. The soil inventories of the PCDD/Fs and PCBs were highly correlated, and the PCDD/F pattern in the soils was similar to the PCDD/F pattern in technical PCB mixtures. There is a large chloralkali chemical complex in Usol’ye Sibirskoe, and the chloralkali industry has caused environmental contamination with PCBs elsewhere. This chemical complex is suspected to have been the source of the PCB and PCDD/F contamination, but due to the paucity of information about this facility it has not yet been possible to confirm this hypothesis. This study illustrates the utility of soil contaminant inventories to trace sources of persistent hydrophobic organic contaminants.

Keywords: Persistent Organochlorine Residues, Seal Phoca-Sibirica, Polychlorinated-Biphenyls, Organic-Compounds, Water, Dibenzofurans, Sediments, Russia, Congeners, Soils

Jimenez, B., Gonzalez, M.J., Jimenez, O., Reich, S., Eljarrat, E. and Rivera, J. (2000), Evaluation of 2,3,7,8 specific congener and toxic potency of persistent polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans in cetaceans from the Mediterranean Sea, Italy. *Environmental Science & Technology*, **34** (5), 756-763.

Full Text: [E\Env Sci Tec34, 756.pdf](E/Env%20Sci%20Tec34,%20756.pdf)

Abstract: The present study investigates individual 2,3,7,8-substituted polychlorinated dibenzo-p-dioxin (PCDD) and polychlorinated dibenzofuran (PCDF) concentrations in cetaceans and assesses the PCDD and PCDF contributions to the total TCDD equivalent concentration. Liver samples of a variety of cetaceans species found stranded along the Italian coasts during the period of 1987-1992 were analyzed for PCDDs and PCDFs. The main aims were to scrutinize levels and patterns of PCDDs and PCDFs for the first time in cetaceans from the Mediterranean Sea and to estimate whether chlorinated compounds mentioned are implicated in the exceptionally high mortality of dolphins that occurred in the Mediterranean Sea during 1990-1992. PCDD and PCDF profiles were dominated by congeners OCCD and OCDF. The new toxic equivalency factors recommended by WHO in 1997 were used for calculation of dioxin-like toxicity. On the basis of our previous study of PCBs, the overall TEQ calculated from the 2,3,7,8-substituted PCDDs and PCDFs do not contribute as much dioxin-like toxicity as PCBs.

Keywords: 1987/88 Mass Mortality, Ortho Coplanar PCBs, Mono-Ortho, Marine Mammals, Organochlorine Pesticides, Delphinapterus-Leucas, Phoca-Vitulina, Coastal Waters, Harbor Seal, Arctic Seal

Ribeiro, A.B., Mateus, E.P., Ottosen, L.M. and Bech-Nielsen, G. (2000), Electrodialytic removal of Cu, Cr, and As from chromated copper arsenate-treated timber waste. *Environmental Science & Technology*, **34** (5), 784-788.

Full Text: [E\Env Sci Tec34, 784.pdf](E/Env%20Sci%20Tec34,%20784.pdf)

Abstract: Waste of wood treated with chromated copper arsenate (CCA) is expected to increase in volume over the next decades. Alternative disposal options to landfilling are becoming more attractive to study, especially those that promote reuse. The authors have studied the electrodialytic removal of Cu, Cr, and As from CCA-treated timber waste. The method uses a low-level direct current as the “cleaning agent”, combining the electrokinetic movement of ions in the matrix with the principle of electrodialysis. The technique was tested in four experiments using a laboratory cell on sawdust of an out-of-service CCA-treated Pinus pinaster Ait, pole. The duration of all the experiments was 30 days, and the current density was kept constant at 0.2 mA/ cm2. The experiments differ because in one the sawdust was saturated with water (experiment 1) and in the rest it was saturated with oxalic acid, 2.5, 5, and 7.5% (w/w), respectively, in experiments 2-4. The highest removal rates obtained were 93% of Cu, 95% of Cr, and 99% of As in experiment 2. Other experimental conditions might possibly optimize the removal rates.

Keywords: Electrokinetic Removal, Wood, Soil, CCA, Metals

Hopke, P.K., Borak, T.B., Doull, J., Cleaver, J.E., Eckerman, K.F., Gundersen, L.C.S., Harley, N.H., Hess, C.T., Kinner, N.E., Kopecky, K.J., McKone, T.E., Sextro, R.G. and Simon, S.L. (2000), Health risks due to radon in drinking water. *Environmental Science & Technology*, **34** (6), 921-926.

Full Text: [E\Env Sci Tec34, 921.pdf](E/Env%20Sci%20Tec34,%20921.pdf)

Abstract: Following more than a decade of scientific debate about the setting of a standard for Rn222 in drinking water, Congress established a timetable for the promulgation of a standard in the 1996 Amendments to the Safe Drinking Water Act. As a result of those Amendments, the EPA contracted with the National Academy of Sciences to undertake a risk assessment for exposure to radon in drinking water. in addition, the resulting committee was asked to address several other scientific issues including the national average ambient Rn222 concentration and the increment of Rn222 to the indoor-air concentration arising from the use of drinking water in a home. A new dosimetric analysis of the cancer risk to the stomach from ingestion was performed. The recently reported risk estimates developed by the BEIR VI Committee for inhalation of radon decay products were adopted. Because the 1996 Amendments permit states to develop programs in which mitigation of air-producing health-risk reductions equivalent to that which would be achieved by treating the drinking water, the scientific issues involved in such “multimedia mitigation programs” were explored.

Keywords: Rn222, Homes

Moyes, L.N., Parkman, R.H., Charnock, J.M., Vaughan, D.J., Livens, F.R., Hughes, C.R. and Braithwaite, A. (2000), Uranium uptake from aqueous solution by interaction with goethite, lepidocrocite, muscovite, and mackinawite: An X-ray absorption spectroscopy study. *Environmental Science & Technology*, **34** (6), 1062-1068.

Full Text: [E\Env Sci Tec34, 1062.pdf](E/Env%20Sci%20Tec34,%201062.pdf)

Abstract: The retention of radionuclides by interaction with mineral phases has significant consequences for the planning of their short- and long-term disposal to geological systems. An understanding of binding mechanisms is important in determining the ultimate fate of radionuclides following release into natural systems and will give increased confidence in predictive models. X-ray absorption spectroscopy (XAS) has been used to study the local environment of uranium taken up from aqueous solution by the surfaces of goethite, lepidocrocite, muscovite, and mackinawite. On both iron hydroxides uranium uptake occurs by surface complexation and ceases when the surface is saturated. The muscovite surface does not become saturated and uptake increases linearly suggesting formation of a uranium phase on the surface. Uranium uptake on mackinawite also suggests a replacement or precipitation process. XAS indicates that bidentate inner-sphere surface complexes are formed on the iron hydroxides by coordination of two surface oxygens from an iron octahedron in the equatorial plane of the complex. Uranium uptake on muscovite may occur through surface precipitation, the first layer of uranium atoms binding through equatorial coordination of two adjacent surface oxygens from a silicate tetrahedron, with the axial oxygens of the uranyl unit aligned across the hexagonal “cavities” created by the rings of tetrahedra. At low concentrations, uptake on mackinawite occurs at locally oxidized regions on the surface via a similar mechanism to that on iron hydroxides. At the highest concentrations, equatorial oxygen bond distances around 2.0-2.1 Angstrom are observed, inconsistent with the presence of uranyl species. The average number of axial oxygens also decreases with increasing concentration, and these results suggest partial reduction of uranium. The nature of these different surface reactions plays an important role in assessing the geochemical behavior of uranium in natural systems, particularly under reducing conditions.

Keywords: Curved-Wave Theory, EXAFS Calculations, Fine-Structure, Adsorption, Surface, Uranyl, Sorption, Coprecipitation, Montmorillonite, Refinement

Sauvé, S., Hendershot, W. and Allen, H.E. (2000), Solid-solution partitioning of metals in contaminated soils: Dependence on pH, total metal burden, and organic matter. *Environmental Science & Technology*, **34** (7), 1125-1131.

Full Text: [E\Env Sci Tec34, 1125.pdf](E/Env%20Sci%20Tec34,%201125.pdf)

Abstract: Environmental risk assessment of metals depends to a great extent on modeling the fate and the mobility of metals based on soil-liquid partitioning coefficients. A large variability is observed among the reported values that could be used to predict metal mobility and bioavailability. To evaluate this, soil-liquid partitioning coefficients (Kd) for many elements but especially for the meta Is cadmium, copper, lead, nickel, and zinc were compiled from over 70 studies of various origins collected from the literature. The relationships between the reported values are explored relative to variations in soil solution pH, soil organic matter (SOM), and concentrations of total soil metal. The results of multiple linear regressions show that Kd values are best predicted using empirical linear regressions with pH (with R2 values of 0.29-0.58) or with pH and either the log of SOM or the log of total metal and with resulting R2 values of 0.42-0.76. A semi-mechanistic model based on the competitive adsorption of metal and H+ [dependent on solution pH, total metal content, and log (SOM)] was a better tool to predict dissolved metal concentrations (with R2 values of 0.61-0.88), with the exception of Pb (at 0.35).

Keywords: Dutch Field Soils, Heavy-Metals, Risk Assessment, Polluted Soils, Trace-Metals, Swiss-Chard, Cadmium, Zinc, Adsorption, Speciation

Nolan, B.T. and Stoner, J.D. (2000), Nutrients in groundwaters of the conterminous United States 1992-1995. *Environmental Science & Technology*, **34** (7), 1156-1165.

Full Text: [E\Env Sci Tec34, 1156.pdf](E/Env%20Sci%20Tec34,%201156.pdf)

Abstract: Results of a national water quality assessment indicate that nitrate is detected in 71% of groundwater samples, more than 13 times as often as ammonia, nitrite, organic nitrogen, and orthophosphate, based on a common detection threshold of 0.2 mg/L. Shallow groundwater (typically 5 m deep or less) beneath agricultural land has the highest median nitrate concentration (3.4 mg/L), followed by shallow groundwater beneath urban land (1.6 mg/L) and deeper groundwater in major aquifers (0.48 mg/L). Nitrate exceeds the maximum contaminant level, 10 mg/L as nitrogen, In more than 15% of groundwater samples from 4 of 33 major aquifers commonly used as a source of drinking water. Nitrate concentration in groundwater is variable and depends on interactions among several factors, including nitrogen loading, soil type, aquifer permeability, recharge rate, and climate. For a given nitrogen loading, factors that generally increase nitrate concentration in groundwater include well-drained soils, fractured bedrock, and irrigation. Factors that mitigate nitrate contamination of groundwater include poorly drained soils, greater depth to groundwater, artificial drainage systems, intervening layers of unfractured bedrock, a low rate of groundwater recharge, and anaerobic conditions in aquifers.

Keywords: Drinking-Water, Nitrate, Pesticides, Risk

Xia, G.S. and Ball, W.P. (2000), Polanyi-based models for the competitive sorption of low-polarity organic contaminants on a natural sorbent. *Environmental Science & Technology*, **34** (7), 1246-1253.

Full Text: [E\Env Sci Tec34, 1246.pdf](E/Env%20Sci%20Tec34,%201246.pdf)

Abstract: The development of appropriate equilibrium sorption relationships for anthropogenic organic contaminants with soils and sediments is essential to predicting the extents and rates of solid-water interactions in the environment. In this context, we previously reported results that showed how nonlinear sorption isotherms with nine low-polarity organic chemicals on a silty aquitard material could be modeled as a combined adsorption-partitioning process. The adsorption component was ascribed to presumed traces of a carbonaceous adsorbent, for which adsorption was well described by a Polanyi-based isotherm, in this work, we report competitive sorption behavior on. the same material, as observed from batch experiments: in binary solute systems that contain combinations of the previously studied sorbates (chorinated benzenes and polyaromatic hydrocarbons) over wide ranges of concentration. The results confirmed our expectation that partitioning is an increasingly dominating contribution to overall sorption when cosorbates are present. Moreover, the competitive effects could be very well predicted on the basis of Polanyi-Manes adsorption theory and the prior single solute results. Overall, the results further validate the applicability of a Polanyi-based modeling approach and lend additional support to the hypothesis that this sorbent contains trace quantities of high surface area carbonaceous material.

Keywords: Distributed Reactivity Model, Adsorption Potential-Theory, Activated Carbon, Hydrophobic Pollutants, Water Solution, Sediments, Soils, Chemicals, Equilibria, Matter

Lloyd, J.R., Yong, P. and Macaskie, L.E. (2000), Biological reduction and removal of Np(V) by two microorganisms. *Environmental Science & Technology*, **34** (7), 1297-1301.

Full Text: [E\Env Sci Tec34, 1297.pdf](E/Env%20Sci%20Tec34,%201297.pdf)

Abstract: The majority of the radionuclides generated by the nuclear fuel cycle can be removed during established remediation processes. However among the long-lived, alpha-emitting actinides neptunium(V) is recalcitrant to removal from solution by physicochemical or biotechnological methods. The latter include a biocrystallization process, based on the enzymatic liberation of phosphate as a precipitating ligand by a Citrobacter sp., which was previously shown to precipitate tetravalent actinides such as Th(IV) and Pu(IV) as their corresponding phosphates. Np(V) was reduced to a lower valence (probably Np(IV)) by ascorbic acid or biologically, using the reductive capability of Shewanella putrefaciens, but reduction alone did not desolubilize Np. However Np(V) was removed by the two organisms, S. putrefaciens and Citrobacter sp. in concert, bioreduction to Np(IV) by S. putrefaciens, together with phosphate liberation by the Citrobacter sp., permitted bioprecipitative removal of Np-237 as well as its daughter (233)protactinium. Tests were made possible by a novel technique permitting actinide separation by paper chromatography followed by quantification of the radioactive species using a phosphorlmager. This study has implications for the development of methods to remove Np(V) from solution, by the simple combination of two biotechnological methods, which can succeed where chemical treatments are ineffective.

Keywords: Dissimilatory Metal Reduction, Enzymatically-Mediated Growth, Hydrogen Uranyl Phosphate, Citrobacter sp, Uranium Bioaccumulation, *Escherichia*-Coli, Aqueous Flows, Heavy-Metals, Plutonium, Neptunium

Notes: highly cited

? Ghosh, U., Gillette, J.S., Luthy, R.G. and Zare, R.N. (2000), Microscale location, characterization, and association of polycyclic aromatic hydrocarbons on harbor sediment particles. *Environmental Science & Technology*, **34** (9), 1729-1736.

Full Text: [2000\Env Sci Tec34, 1729.pdf](2000/Env%20Sci%20Tec34,%201729.pdf)

Abstract: Complementary mass spectrometric and spectroscopic techniques were employed to provide direct information at the microscale on the sequestration of polycyclic aromatic hydrocarbon (PAH) contaminants in Milwaukee Harbor sediment particles. Microprobe two-step laser desorption/ laser ionization mass spectrometry was used for PAH measurements, infrared microspectroscopy was used for organic carbon measurement, and scanning electron microscopy with wavelength dispersive X-ray spectroscopy was used for elemental microanalysis. PAH concentrations on coal- and wood-derived particles were found to be several orders of magnitude higher than on silica particles. A cryomicrotome sectioning procedure was employed for particle cross-sectional investigations, and it was found that most PAHs are concentrated on external surface regions indicating near surface sorption mechanisms. The coal/wood-derived particles constitute only 5% of the sediment by weight but contain 62% of the total PAHs. The remaining 38% are mainly in a clay and silt fraction. PAH desorption kinetic studies on these separated fractions revealed a relatively low availability of PAHs from the coal/ wood fractions and a high availability from the clay/silt fraction. Additionally, these PAH-bearing coal/wood-derived particles may be removed by density separation from heavier clay, silt, and sand.

Keywords: Bioavailability, Carbon, Desorption, Desorption-Kinetics, Geosorbents, Lake-Michigan, Model, Organic-Chemicals, Particles, Polychlorinated-Biphenyls, Sequestration, Soils, Sorption

Chiu, V.Q. and Hering, J.G. (2000), Arsenic adsorption and oxidation at manganite surfaces. 1. Method for simultaneous determination of adsorbed and dissolved arsenic species. *Environmental Science & Technology*, **34** (10), 2029-2034.

Full Text: [E\Env Sci Tec34, 2029.pdf](E/Env%20Sci%20Tec34,%202029.pdf)

Abstract: Arsenic occurs in the +III oxidation state as a metastable species in oxic waters. Under oxic conditions, As(III) is both more mobile in natural waters and less efficiently removed by water treatment processes than As(V). Other oxidants, however, can react with As(III) more rapidly than oxygen. The oxidation of As(III) by manganite occurs on the time scale of hours. Here, a method is introduced for the rapid determination of the total and dissolved concentrations of arsenic species in this heterogeneous system, adsorbed arsenic concentrations are calculated by difference. The oxidation reaction is quenched by the addition of ascorbic acid to effect the reductive dissolution of manganite and concomitant release of adsorbed As(III) and As(V) into solution. Once in solution, As(III) and As(V) are separated using anion-exchange chromatography. Comparison of dissolved and total concentrations of As(III) and As(V) clearly illustrates that the overall conversion rate of As(III) to As(V) in this system would be overpredicted based solely on dissolved As(III) concentrations and underpredicted based solely on dissolved As(V) concentrations. The overall conversion of As(III) to As(V) was more rapid at pH 4 than at pH 6.3 and was unaffected by the presence of boric acid at 95 µM or 3 mM. However, the presence of 200 µM phosphate (at pH 4) decreased the overall rate of conversion of As(III) to As(V). Comparison of total and dissolved As(III) concentrations during the reaction time course demonstrates that the effects of pH and phosphate on adsorbed As(III) concentrations are generally consistent with these kinetic observations.

Keywords: Reductive Dissolution, Lacustrine Sediments, Drinking-Water, Removal, As(III), Speciation, Stability, Oxyhydroxides, Coagulation, Constraints

Notes: highly cited

Trivedi, P. and Axe, L. (2000), Modeling Cd and Zn sorption to hydrous metal oxides. *Environmental Science & Technology*, **34** (11), 2215-2223.

Full Text: [E\Env Sci Tec34, 2215.pdf](E/Env%20Sci%20Tec34,%202215.pdf)

Abstract: The mobility and bioavailability of Cd and Zn in soils and sediments are affected by contaminant distribution mechanisms. One important process is sorption to hydrous aluminum, iron, and manganese oxides, which are ubiquitous in soils and sediments as both discrete particles and coatings and exhibit a high affinity for these metals. Mechanistic models are required for accurately assessing risks to populations and in the long-term management of contaminated soils and sediments. This research demonstrates intraparticle diffusion is the rate-limiting step in the sorption of Cd and Zn to microporous oxides. Furthermore, as much as 90% of the total sorption sites on the oxides reside on the micropore walls. Because longterm experiments require a lengthy period of time, predictive methods would be useful for determining surface diffusivities. Theoretically, surface diffusivities can be predicted from site activation theory, which is based on the random walk model where atoms or molecules vibrate at localized sites along the surface. Once the vibrating ion has sufficient energy, it will jump to a neighboring site. For a given metal, the associated activation energy was observed to be equivalent for all three oxides, in an effort to predict this energy, a correlation is presented between the adsorption enthalpy and the adsorbate hydrated radius, for each oxide, the Polanyi constant (alpha) that relates adsorption enthalpy and activation energy was equivalent for the transition metals studied.

Keywords: Activation, Activation Energy, Adsorption, Adsorption Enthalpy, Bioavailability, Cd, Coatings, Contaminated Soils, Diffusion, Enthalpy, Experiments, Intraparticle Diffusion, Iron, Management, Manganese, Mechanisms, Metal, Metals, Methods, Mobility, Model, Modeling, Models, Oxide, Oxides, Particles, Random Walk, Rate Limiting Step, Rate-Limiting Step, Research, Risks, Soils, Sorption, Theory

Ponder, S.M., Darab, J.G. and Mallouk, T.E. (2000), Remediation of Cr(VI) and Pb(II) aqueous solutions using supported, nanoscale zero-valent iron. *Environmental Science & Technology*, **34** (12), 2564-2569.

Full Text: [E\Env Sci Tec34, 2564.pdf](E/Env%20Sci%20Tec34,%202564.pdf)

Abstract: Borohydride reduction of an aqueous iron salt in the presence of a support material gives supported zero-valent iron nanoparticles that are 10-30 nm in diameter. The material is stable in air once it has dried and contains 22.6% iron by weight. The supported zero-valent iron nanoparticles (“Ferragels”) rapidly separate and immobilize Cr(VI) and Pb(II) from aqueous solution, reducing the chromium to Cr(III) and the Pb to Pb(0) while oxidizing the Fe to goethite (alpha-FeOOH). The kinetics of the reduction reactions are complex and include an adsorption phase. About 10% of the iron in the material appears to be located at active surface sites. Once these sites have been saturated, the reduction process continues but at a much lower rate, which is likely limited by mass transfer. Rates of remediation of Cr(VI) and Pb(II) are up to 30 times higher for Ferragels than for iron filings or iron powder on a (Fe) molar basis. Over 2 months, reduction of Cr(VI) was 4.8 times greater for Ferragels than for an equal weight of commercial iron filings (21 times greater on the basis of moles of iron present). The higher rates of reaction, and greater number of moles of contaminant reduced overall, suggest that Ferragels may be a suitable material for in situ remediation.

Keywords: Reductive Dehalogenation, Subsurface Remediation, Chromate Reduction, Metal, Degradation, Water, Particles, Soil, Trichloroethylene, Dechlorination

Pagnanelli, F., Papini, M.P., Toro, L., Trifoni, M. and Vegliò, F. (2000), Biosorption of metal ions on Arthrobacter sp.: Biomass characterization and biosorption modeling. *Environmental Science & Technology*, **34** (13), 2773-2778.

Full Text: [E\Env Sci Tec34, 2773.pdf](E/Env%20Sci%20Tec34,%202773.pdf)

Abstract: A culture of Arthrobacter sp, was tested for its ability to sorb copper, cadmium, and iron ions, and chemical modeling of experimental data was used to interpret the mechanism of biosorption. The purpose of the initial phase was to clarify the nature and concentration of active acidic sites on cell wall with the aid of potentiometric titration of an aqueous cellular suspension and IR analysis of the lyophilized biomass in solid phase. The experimental results showed that the cell wall probably has at least two weakly acidic sites. In the second part of the experimental work Arthrobacter sp, was suspended in the presence of copper, cadmium, and iron ion solutions at different equilibrium pH values. Adsorption isotherms were obtained by using an original procedure defined as the “subsequent additions method” (SAM). The results showed a strong influence of pH, especially over pH 5. A chemical model based on a possible set of reactions between ions in solution and the biomass has been developed. Mechanistic modeling revealed the complexity of the metal biosorption phenomenon and the need to consider different biosorption mechanisms. Up to pH 5 experimental data at different equilibrium pH values can be described using a model which takes into account only two mechanisms (ion exchange and complexation). Over pH 5 other mechanisms (probably precipitation or coprecipitation an cell wall surface) should be considered.

Keywords: Exchange, Removal

Baker, J.I. and Hites, R.A. (2000), Is combustion the major source of polychlorinated dibenzo-p-dioxins and dibenzofurans to the environment? A mass balance investigation. *Environmental Science & Technology*, **34** (14), 2879-2886.

Full Text: [E\Env Sci Tec34, 2879.pdf](E/Env%20Sci%20Tec34,%202879.pdf)

Abstract: We have summarized some of the significant work characterizing polychlorinated dibenzo-p-dioxin and dibenzofuran (PCDD/F) sources and sinks to and from the atmosphere. Much of this effort has focused on estimating emissions from combustion sources and comparing those estimates to atmospheric deposition measurements. Despite significant growth in the available data for emissions and for deposition, it still appears that total PCDD/F deposition exceeds emissions by well over a factor of 2. We have further investigated this phenomenon by first developing a method to estimate PCDD/F emissions for countries where these data are lacking. Second, we have investigated the global mass balance of PCDD/F on a homologue-specific basis, taking into account degradation by reactions with the OH radical. We have found that most of the mass balance discrepancy is due to the octachlorinated dibenzo-p-dioxin (OCDD) congener. We suggest that the photochemical synthesis of OCDD from pentachlorophenol (PCP) in atmospheric condensed water is the most significant source of OCDD to the environment. Further research directions in this area are suggested.

Keywords: Chlorinated Dioxins, Source Inventory, Fly-Ash, Pentachlorophenol, Deposition, Furans, PCDD, Atmosphere, Sediments, Budget

? Zhu, L.Z. and Chen, B.L. (2000), Sorption behavior of p-nitrophenol on the interface between anion-cation organobentonite and water. *Environmental Science & Technology*, **34** (14), 2997-3002.

Full Text: [2000\Env Sci Tec34, 2997.pdf](2000/Env%20Sci%20Tec34,%202997.pdf)

Abstract: A series of anion-cation organobentonite are prepared by incorporating both cationic surfactant bromide dodecyltrimethylammonium (DTMAB) and anionic surfactant sodium dodecyl sulfate (SDS) to bentonite. The results indicate that the organic carbon contents of the organobentonites are proportional to the amounts of anionic and cationic surfactants in bentonite. The amount of organic pollutant removed from water depends greatly on the amount of SDS and DTMAB in the bentonite. Partition acid adsorption contributions to the sorption amount of p-nitrophenol on organobentonites are described quantitatively. The mixed surfactants on anion-cation organobentonites excellently created partition mediums for organic pollutants in water. The removal rate of organic pollutants from water is improved by synergistic solubilization in both anionic and cationic surfactant moieties of the organobentonites. The effect of synergistic solubilization results mainly from partition at higher concentrations or adsorption at lower concentrations.

Keywords: Organic-Compounds, Tetrachloromethane Sorption, Aromatic-Hydrocarbons, Clay, Adsorption, Surfactants, Solubility, Smectite, Pentachlorophenol, Contaminants

Reardon, E.J. and Wang, Y.X. (2000), A limestone reactor for fluoride removal from wastewaters. *Environmental Science & Technology*, **34** (15), 3247-3253.

Full Text: [E\Env Sci Tec34, 3247.pdf](E/Env%20Sci%20Tec34,%203247.pdf)

Abstract: A two-column limestone reactor has been designed to reduce fluoride concentrations from wastewaters to below the maximum contaminant level (MCL limit) of 4 mg/L. The reactor functions by forcing calcite (CaCO3) to dissolve and fluorite (CaF2) to precipitate in the first column. The second column is not necessary to remove fluoride but is used to precipitate the calcite dissolved in the first column. This returns the treated water to its approximate initial composition. In laboratory experiments, the fluoride concentration of the effluent from feedwaters containing initial F amounts of up to 109 mg/L were brought below the MCL limit of 4 mg/L with a porewater residence time within the column of 2 h, Profile sampling shows that fluoride is reduced from 109 to 8 mg/L after only 35 min within the reactor. The major advantage of this potential technology over existing liming and ion exchange methods is that system monitoring is minimal, regular column regeneration is not required, and chemicals are not permanently added to the water. Because the CaCO3 dissolved in the first column is precipitated in the second, the reactor has potential application to reduce the concentrations from wastewaters of contaminants similar in charge and size to Ca2+ and CO32- through coprecipitation reactions. In a pilot experiment where fly ash leachate was spiked with mg/L levels of Cd, As, Cr, and Se and directed through the reactor, reductions in all elements except Gr occurred. Cd was the most notable. Influent concentrations from 2 to 30 mg/L were reduced to below detection (<0.01 mg/L).

Keywords: Adsorption, Water, Equilibria

? Leboeuf, E.J. and Weber, Jr., W.J. (2000), Macromolecular characteristics of natural organic matter. 1. Insights from glass transition and enthalpic relaxation behavior. *Environmental Science & Technology*, **34** (17), 3623-3631.

Full Text: [2000\Env Sci Tec34, 3623.pdf](2000/Env%20Sci%20Tec34,%203623.pdf)

Abstract: This is the first of a series of papers focusing on an experimental investigation of mechanisms contributing to the sequestration of hydrophobic organic compounds (HOCs) by macromolecular natural organic matter (NOM). It presents the results of a detailed study by differential scanning calorimetry (DSC) of NOM-related glass transition and enthalpic relaxation phenomena. Parallel measurements for model synthetic organic macromolecules of well characterized structure provide a basis for interpretation of the observed behaviors of the structurally heterogeneous and relatively ill-characterized natural organic materials investigated. The effects of varied DSC heating rates reveal transition temperature and enthalpic relaxation responses consistent with the Gibbs-Dimarzio glass transition theory, thus providing definitive evidence to support our earlier reports of the occurrence of glassy/rubbery state transitions in NOM macromolecules. Quantification of maximum changes in heat capacity for enthalpic relaxation phenomena provides insights into the types of physical and chemical bonds that limit glassy-state macromolecular mobility. Marked reductions by sorbed water of the effective temperature at which glass transition phenomena occur for hydrophilic NOMs are observed, suggesting that the thermodynamic states of NOM macromolecules are influenced in natural systems by the presence of large concentrations of sorbing molecules. The thermodynamic states of the more hydrophobic components or regions of NOM macromolecules, for example, are likely influenced by large amounts of sorbed HOCs in a manner similar to that affected by sorbed water for hydrophilic macromolecules. Finally, ramifications of the findings with respect to alternative remediation end points are discussed.

Keywords: Adsorption, Coals, Distributed Reactivity Model, Equilibria, Mechanisms, Pollutants, Sediments, Soil, Sorption, Water

? Leboeuf, E.J. and Weber, Jr., W.J. (2000), Macromolecular characteristics of natural organic matter. 2. Sorption and desorption behavior. *Environmental Science & Technology*, **34** (17), 3632-3640.

Full Text: [2000\Env Sci Tec34, 3532.pdf](2000/Env%20Sci%20Tec34,%203532.pdf)

Abstract: The effects of the relative macromolecular mobilities of natural organic matter (NOM) matrices on their sorption/desorption behavior with respect to phenanthrene are described. Sorption isotherm characteristics are found to correspond directly to the relative dominance of glassy and rubbery states, with nonlinear sorption being linked to the dominance of glassy regions within the natural and synthetic macromolecules examined. The Dual Reactive Domain Model (DRDM) developed in earlier studies provides an effective tool for identifying specific adsorption and absorption contributions to overall isotherm patterns. The Hysteresis Index (H.I.), also developed in earlier studies, is useful for quantifying differences between the sorption and desorption isotherms for each macromolecular sorbent. Confirming earlier observations with soils and sediments, a trend of increasing H.I. with decreasing oxygen/carbon (O/C) atomic ratio is generally observed for the NOMs investigated. Correlation of isotherm nonlinearity and H.I, with macromolecular mobility is hypothesized and tested, leading to a general conclusion that the extent of isotherm nonlinearity and the H.I. are related to increasing glass transition temperature (T-g) of the NOM. Macromolecular sorbents display little or no desorption hysteresis under experimental conditions at or very near their T-g, while sorbents that are clearly in their glassy state under those conditions manifest significant desorption hysteresis. This may relate in part to the fact that the times required for attainment of true sorption and/or desorption equilibria vary with the mobility and flexibility of macromolecular sorbent matrices, attaining only over extremely long periods of solute migration into and out of the less flexible glassy states of such matrices.

Keywords: Adsorption-Desorption, Contaminants, Distributed Reactivity Model, Glass-Transition, Hydrophobic Pollutants, Hysteresis, Irreversible Binding, Naphthalene, Sediments, Soils

Fowle, D.A., Fein, J.B. and Martin, A.M. (2000), Experimental study of uranyl adsorption onto Bacillus subtilis. *Environmental Science & Technology*, **34** (17), 3737-3741.

Full Text: [E\Env Sci Tec34, 3737.pdf](E/Env%20Sci%20Tec34,%203737.pdf)

Abstract: Uranyl adsorption onto the Gram-positive soil bacterium Bacillus subtilis was measured using hatch experiments in 0.1 M NaClO4 as a function of pH, time, and solid: solute ratio at: 25°C. The experimental data were interpreted using a surface complexation approach. The experimental measurements constrain the stoichiometry and thermodynamic stabilities of the important uranyl-surface complexes. The U adsorption data require two separate adsorption reactions, with the uranyl ion forming surface complexes with the neutral phosphate functional groups and the deprotonated carboxyl functional groups of the bacterial cell wall: R-PDH0 + UO22+ <-> R-POH-UO22+ (log K = 11.8±0.2) and R-COO-+ UO22+ <-> R-COO-UO2+ (log K = 5.4±0.2). These new stability constants, in conjunction with other experimental and predicted stability constants, may be incorporated in surface complexation models to determine the mobility and fate of TL in bacteria-bearing water-rock systems.

Keywords: Surface Complexation Model, Partial Molal Properties, Metal Adsorption, Cell-Wall, Uranium, Bioaccumulation, Temperatures, Pressures, Standard, Sites

? Li, Z.H., Burt, T. and Bowman, R.S. (2000), Sorption of ionizable organic solutes by surfactant modified zeolite. *Environmental Science & Technology*, **34** (17), 3756-3760.

Full Text: [2000\Env Sci Tec34, 3756.pdf](2000/Env%20Sci%20Tec34,%203756.pdf)

Abstract: We determined the sorption of ionizable organic solutes on a natural zeolite modified with hexadecyltrimethyl ammonium (HDTMA), a cationic surfactant. The sorption of benzene and its ionizable analogues phenol and aniline by surfactant-modified zeolite (SMZ), prepared at different HDTMA surface coverages, was affected by solution pH. All of the sorption isotherms were linear and could be described by a distribution coefficient (K-d) At neutral pH, the K-d values of benzene, phenol, and aniline on SMZ increased with HDTMA loading up to monolayer coverage of 100 mmol/kg. Beyond monolayer coverage, further increases in HDTMA loading did not increase the K-d values of the solutes at pH 7.0, where all species exist primarily in their neutral forms. The K-d values were consistent with the relative octanol-water partition coefficients of the three compounds, indicating that sorption of the neutral species was primarily by partitioning into the bound HDTMA organic pseudophase. Phenol sorption by SMZ treated to bilayer coverage increased as the pH, and hence fraction of anionic phenolate, increased. The counterion balance indicated that the increased retention of phenol was due partially to anion exchange of phenolate for bromide, the same mechanism responsible for sorption of inorganic anions by SMZ. In contrast, decreases in pH resulted in reduced aniline sorption due to a lower concentration of the neutral species and repulsion of the positively charged anilinium from SMZ treated to bilayer coverage. The results demonstrate that sorption of target species can be maximized by tailoring the HDTMA surface coverage to account for species and solution characteristics.

Keywords: Adsorption, Ammonium, Aniline, Benzene, Cationic Surfactant, Cations, Chromate, Clay, Concentration, Distribution, Distribution Coefficient, Hdtma, Inorganic, Inorganic Anions, Isotherms, Loading, Mechanism, Modified Clinoptilolite, Natural, Organic, Oxyanions, Partition, Partition Coefficients, Partitioning, pH, Phenol, Retention, Sorption, Sorption Isotherms, Surfactant, Target Species, Zeolite

Van Herck, P., Vandecasteele, C., Swennen, R. and Mortier, R. (2000), Zinc and lead removal from blast furnace sludge with a hydrometallurgical process. *Environmental Science & Technology*, **34** (17), 3802-3808.

Full Text: [E\Env Sci Tec34, 3802.pdf](E/Env%20Sci%20Tec34,%203802.pdf)

Abstract: During the production of pig iron in a blast furnace, a Zn- and Pb-containing sludge is generated in the air pollution control system. This toxic waste can be landfilled after dewatering and pretreatment, which is very costly. The sludge particles contain large amounts of Fe and C that could be recycled in the furnace. However, the Zn content of the sludge is high, and the Zn input to the blast furnace must be limited, so Zn has to be removed. This paper describes a hydrometallurgical process whereby the sludge is leached under both acid (HCl) and oxidizing conditions. After the separation of the solids, which mainly contain C and Fe, from the leaching solution, the latter is passed through an anion exchanger to remove Zn and Pb and is recirculated to the reactor. Investigation of the leaching behavior showed that a pH below 1.5 and a redox potential above 650 mV are required to obtain high leaching efficiencies for Zn and Pb. Sequential extraction showed that the largest part of Zn and Ph is extracted in acid medium, whereas an additional 16-18% is extracted in oxidizing acid medium. XRD analysis showed that after acid leaching, Zn partially occurs as sfalerite and as Franklinite. Comparison of the leaching behavior of the sludge with that of sfalerite and Franklinite geochemical standards confirmed this and showed that sfalerite dissolves in acid oxidizing conditions, whereas the Franklinite does not. Calculations with the geochemical speciation program MINTEQA2 were compared with experimental results, and the process developed was tested in a pilot plant.

Keywords: Sequential Extractions, Pitfalls

Chen, C.Y. and Folt, C.L. (2000), Bioaccumulation and diminution of arsenic and lead in a freshwater food web. *Environmental Science & Technology*, **34** (18), 3878-3884.

Full Text: [E\Env Sci Tec34, 3878.pdf](E/Env%20Sci%20Tec34,%203878.pdf)

Abstract: This study provides strong evidence for biotic accumulation of two metals in a contaminated watershed and diminution of both metals from lower trophic levels to fish. Bioaccumulation of As and Pb in water and four food web components (particulates, two size fractions of zooplankton, and six species of fish) were measured on three dates in Upper Mystic Lake (UML), MA, which is located in the As-contaminated Aberjona Watershed. Arsenic and Pb levels in small and large plankton and fish biodiminished with increasing trophic level, but only As was elevated in lower trophic levels relative to uncontaminated food webs. Metal levels in water and biota differed by date and were lowest in the spring and, in most cases, highest in summer samples. Variation in metal accumulation in zooplankton across dates may be due to changes in metal concentrations in the aqueous and particulate phase over time. Metal burdens in fish with different feeding strategies were also compared. We found the highest As in planktivorous species that feed directly on the metal-enriched zooplankton, but no differences were observed for Pb concentrations between fish groups. Finally, we compared the levels of As and ph in food web components in UML relative to 20 uncontaminated lakes in New England and found that As levels but not Pb in particulates and zooplankton were higher in UML. This provides the first evidence that As contamination in the Aberjona Watershed is being transferred to the biota at lower trophic levels. Nevertheless, despite elevated As in zooplankton, pronounced diminution between zooplankton and fish in UML appears to result in concentrations of As in fish that do not differ from uncontaminated systems.

Keywords: Northeastern US Lakes, Trophic Transfer, Water, Fish, Phytoplankton, Speciation, Plankton, Invertebrates, Alkalinity, Organisms

Layton, A.C., Gregory, B.W., Seward, J.R., Schultz, T.W. and Sayler, G.S. (2000), Mineralization of steroidal hormones by biosolids in wastewater treatment systems in Tennessee USA. *Environmental Science & Technology*, **34** (18), 3925-3931.

Full Text: [E\Env Sci Tec34, 3925.pdf](E/Env%20Sci%20Tec34,%203925.pdf)

Abstract: During the past several years, concern has risen over potential pollution of waterways with estrogenic compounds, including steroidal hormones from human and animal sources. One potential source of steroid hormone contamination is through the incomplete removal of these compounds in wastewater treatment systems (WTS). To address this issue, laboratory mineralization assays using C-14-labeled estrogens and testosterone were performed with biosolids from four municipal treatment plants and one industrial system. The importance of adapted microbial populations in the removal of estrogen was shown by the dramatic differences in mineralization of C-14-17 beta-estradiol by biosolids from a municipal plant compared to that from the industrial plant, 84% versus 4%, respectively. Indeed, biosolids from all of the municipal plants mineralized 70-80% of added C-14-17 beta-estradiol to (CO2)-C-14 in 24 h. Removal of C-14-17 beta-estradiol from the aqueous phase by biodegradation and/or biosorption to cell matter was greater than 90%. A recombinant yeast estrogen assay (YES assay) also confirmed that biological estrogenic activity was removed from the biosolid samples to below the detection limit (1.56 nM). C-14-Testosterone was mineralized to (CO2)-C-14 in all four municipal biosolids in amounts ranging from 55% to 65%, moreover, total removal of C-14-testosterone from the aqueous phase was 95%. First-order rate constants k were obtained for the mineralization and removal from the aqueous phase of natural and a synthetic steroid hormone in biosolids from one WTP. In these biosolids, C-14-17 beta-estradiol and C-14-testosterone were rapidly mineralized to C-14-CO2 (k = 0.0042 ± 0.0002 min-1 and 0.0152 ± 0.0021 min-1, respectively), whereas the mineralization of the synthetic estrogen C-14-17 alpha-ethinylestradiol was 25-75-fold less (k = 0.0002 ± 0.0000 min-1). In addition, mineralization of C-14-ethinylestradiol did not reach completion in 24 h with only 40% mineralized to C-14-CO2. Approximately 20% of the C-14-ethinylestradiol remained in the aqueous phase and was biologically active as determined by the YES assay. Changes in temperature of approximately 15°C had a statistically significant effect on the rate of mineralization and removal of C-14-17 beta-estradiol from the aqueous phase but not for C-14-testosterone or C-14-17 alpha-ethinylestradiol. These results suggest that biosolids in municipal plants in this region have the capability to remove natural steroid hormones in their influents over a range of temperatures but may be less effective at removing the synthetic estrogen 17 alpha-ethinylestradiol.

Keywords: Sewage-Treatment Plants, Estrogenic Activity, United-Kingdom, Stw Effluent, Fish, Chemicals, Identification, Disruption, Behavior, Waters

Figueira, M.M., Volesky, B., Azarian, K. and Ciminelli, V.S.T. (2000), Biosorption column performance with a metal mixture. *Environmental Science & Technology*, **34** (20), 4320-4326.

Full Text: [E\Env Sci Tec34, 4320.pdf](E/Env%20Sci%20Tec34,%204320.pdf)

Abstract: The biosorption of Cu, Cd, and Zn from multicomponent mixtures was studied in equilibrium systems and in a flow-through column packed with potassium-saturated *Sargassum* algal biosorbent. Pretreatment of the biomass with calcium-, sodium-, magnesium-, and potassium-hydroxides was examined. KOH washing resulted in a stable biosorbent with an improved affinity for Zinc. Two-metal sorption resulted in Zn breaking through the column faster than Cd due to its low affinity. The sharp favorable Zn breakthrough curve can be explained by its affinity toward the biomass which is higher than that of K. An overshoot of the Zn exit concentration was observed and explained by the ion exchange between Cd and Zn, whereby the higher-affinity Cd from the solution displaces Zn already bound to the biosorbent. The same effect was observed for Zn, and to a lesser extent Cd, in three-metal sorption (Zn, Cd, Cu). The Cd exit concentration also exceeded its feed level as Cu displaced it on the binding sites of the biomass in the bed. The time interval between Zn and Cd breakthroughs was much shorter than that between the breakthrough points of Cd and Cu. This is because the relative affinities of Zn and Cd, determined from batch equilibrium experiments, are much closer to each other (Zn/K = 1.96 and Cd/K = 3.71) than to Cu (Cu/K = 16.51). The application of experimental IMPACT computer software examined was only partially successful in exactly simulating the biosorption column performance.

Keywords: *Sargassum* Fluitans, Ionic-Strength, Protons, Biomass, pH

Ferrario, J.B., Byrne, C.J. and Cleverly, D.H. (2000), 2,3,7,8-dibenzo-p-dioxins in mined clay products from the United States: Evidence for possible natural origin. *Environmental Science & Technology*, **34** (21), 4524-4532.

Full Text: [E\Env Sci Tec34, 4524.pdf](E/Env%20Sci%20Tec34,%204524.pdf)

Abstract: Ball clay was the source of dioxin contamination discovered in selected chickens analyzed as part of a joint U.S. Department of Agriculture/U.S. Environmental Protection Agency national survey of the U.S. poultry supply conducted in 1997. The affected animals, which had been raised in the southern United States, represented approximately 5% of the national poultry production. All of these chickens and other animal food sources (i.e., farm-raised catfish), similarly contaminated, were fed a diet of animal feed containing ball clay as an anti-caking additive. The clay was mined in northwestern Mississippi within a geological formation referred to as the Mississippi Embayment. Individual raw and processed ball clay samples were analyzed for the presence of the 2,3,7,8-PCDDs/ -PCDFs. The average toxic equivalents (TEQs) for the raw and processed samples were 1513 and 966 ppt dw, respectively. Other mined clay-based products used in animal feeds revealed lower TEQs. All of the products exhibited either an absence of detectable concentrations of 2,3,7,8-PCDFs or concentrations 2-3 orders of magnitude lower than the PCDDs. The isomer distribution, specific isomer identification, and congener profile of the PCDDs in the clay were established and compared to known sources of dioxin contamination. Several unique features of this isomer distribution are characteristic of the clays and are distinguishable from those of other known sources. These characteristics found in prehistoric clay deposits in the United States and Germany have led to speculation attributing their presence to natural geologic processes.

Keywords: Dibenzo-p-Dioxins, Resolution Mass-Spectrometry, Furans, Contamination, Biphenyls, Patterns, Trends, Level, PCBs, Soil

Stanmore, B.R. and Clunies-Ross, C. (2000), An empirical model for the De Novo formation of PCDD/F in medical waste incinerators. *Environmental Science & Technology*, **34** (21), 4538-4544.

Full Text: [E\Env Sci Tec34, 4538.pdf](E/Env%20Sci%20Tec34,%204538.pdf)

Abstract: Tests in a 10 kg h-1 pilot scale incinerator burning medical waste showed that the amounts of PCCD/F formed when cooling from 900 degreesC to ambient were almost proportional to the residence time in the 400-200 degreesC range. This suggests that gas-phase adsorption control rather than kinetic control was operating. A generalized model of PCCD/F formation was developed for a chlorine-rich gas phase, based on diffusion of HCl to the fly ash surface. It was necessary to incorporate a “sticking factor” alpha, which specifies the fraction of molecules that are retained on the ash surface and subsequently enter into reaction. The calculation combines rates for the formation and destruction mechanisms that are effective in the range of 400-225 degreesC. Application of the model requires knowledge of the cooling regime, the specific surface area of fly ash, its concentration at the sampling point, and the initial surface concentration of PCCD/F. It assumes that all the PCCD/F emitted from waste incinerators is associated with the fly ash. The model satisfactorily simulates the upper temperature window for PCCD/F formation and the effect of cooling regime on rate. When tested on a number of commercial incinerators with varying levels of gas cleaning efficiency, the value of alpha was found to depend on the downstream cleaning facilities, being 4-5×10-8 for gas cleaning systems involving only solids removal (wet scrubbing) and 1-3×10-9 for those utilizing adsorption processes for gas-phase components as well (lime, carbon). The latter appears to be the true value for surface formation processes. The presence of sulfur in the fuel forces the value of alpha downward.

Keywords: Municipal Waste, Fly-Ash, Dioxin Formation, Combustion, Emissions, Parameters, Prevention, Mechanisms, De NOVO, Carbon

Young, K.D. and Leboeuf, E.J. (2000), Glass transition behavior in a feat humic acid and an aquatic fulvic acid. *Environmental Science & Technology*, **34** (21), 4549-4553.

Full Text: [E\Env Sci Tec34, 4549.pdf](E/Env%20Sci%20Tec34,%204549.pdf)

Abstract: This paper presents the results of a thermal investigation of the physical and chemical properties constituting the macromolecular structure of natural organic matter (NOM). It presents new evidence of glass transition phenomena in a peat humic acid and a stream-derived fulvic acid as identified through use of temperature-modulated differential scanning calorimetry (TMDSC) and thermal mechanical analysis (TMA). Identification of glass transition temperatures (T(g)s) in both soil- and stream-derived humic materials suggests a general macromolecular structure for humic and fulvic materials in NOM. Quantified T(g)s are found to be related to their elemental and chemical functional group composition, where a more aromatic peat humic acid possesses higher glass transition temperatures than Suwannee River fulvic acid. Theory of glass transition behavior is used as a backdrop to explore the potential use of thermal analysis techniques for quantifying other thermodynamic parameters of NOM, including specific heat capacity, compressibility, and thermal expansion coefficient. Use of this information is then discussed in terms of its application to developing and verifying molecular simulation modeling of NOM structures.

Keywords: Distributed Reactivity Model, Hydrophobic Organic-Compounds, Aqueous-Solution, Sorption, Sediments, Matter, Soils, Substances, Domains, Contaminants

Celis, R., Hermosín, M.C. and Cornejo, J. (2000), Heavy metal adsorption by functionalized clays. *Environmental Science & Technology*, **34** (21), 4593-4599.

Full Text: [E\Env Sci Tec34, 4593.pdf](E/Env%20Sci%20Tec34,%204593.pdf)

Abstract: Organic ligands containing the thiol (-SH) metal-chelating functionality were either grafted to the external surface silanol groups of sepiolite or introduced in the interlayers of montmorillonite, and the resulting functionalized clays were characterized and assayed as adsorbents for Hg(II), Pb(II), and Zn(II) ions from solution. Sepiolite was functionalized by covalently grafting 3-mercapto-pro-pyltrimethoxysilane (MPS) to the surface = SI-OH groups of the clay, whereas montmorillonite was functionalized by replacement of the interlayer inorganic cation (Na+) by 2-mercaptoethylammonium (MEA) cations. These clay-organic ligand systems were selected to minimize the congestion of the internal porosity of the clays, which has recently been shown to be the main obstacle to heavy metal adsorption by functionalized clays. Infrared spectroscopy and elemental analyses demonstrated the presence of the organic ligands in the modified clays. X-ray diffraction analysis indicated the organic cations (MEA) occupied the interlayers of montmorillonite. N2 specific surface area measurements suggested that much of the surface area of montmorillonite and sepiolite remained accessible upon functionalization and that the organic ligand kept the montmorillonite interlayers open. The functionalized clays adsorbed most of the Hg(II) ions present in solution up to saturation and were also good adsorbents of Pb(II) at low metal ion concentrations (i.e., <0.02 mM). They were, however, less effective toward Pb(II) and Zn(II) at high metal ion concentrations. The presence of NaNO3 or Ca(NO3)2<bullet>(.) as background electrolytes at concentrations ranging from 0.001 to 0.1 M did not alter the great adsorption capacity of functionalized sepiolite for Hg(II). The results show that clay functionalization can be optimized by matching clay structure with a suitable reactive (i.e., fibrous clay with a graftable ligand or expandable clay with an exchangeable cationic ligand) and minimizing the gallery volume taken up by the organic ligand, thus improving the performance of the functionalized clay as adsorbent of heavy metals from solution.

Keywords: Montmorillonite, Silica, Ions, Adsorbents, Sorbents, Removal, Water, Hg2+

Wagner-Döbler, I., von Canstein, H., Li, Y., Timmis, K.N. and Deckwer, W.D. (2000), Removal of mercury from chemical wastewater by microoganisms in technical scale. *Environmental Science & Technology*, **34** (21), 4628-4634.

Full Text: [E\Env Sci Tec34, 4628.pdf](E/Env%20Sci%20Tec34,%204628.pdf)

Abstract: The enzymatic reduction of Hg(II) to water insoluble Hg(0) by mercury resistant bacteria has been used for removal of mercury from wastewater in technical scale. Pure cultures of seven mercury resistant strains of *Pseudomonas* were immobilized on carrier material inside a 700 L packed bed bioreactor. Neutralized chloralkali electrolysis wastewater with a mercury concentration of 3-10 mg/L. was continuously fed into the bioreactor (0.7 m3)/h up to (1.2 m3)/h. A mercury retention efficiency of 97% was obtained within 10 h of inoculation of the bioreactor. At optimum performance, bioreactor outflow concentrations were below 50 µg Hg/L, which fulfill the discharge limit for industrial wastewater. In combination with an activated carbon filter, outflow concentrations below 10 µg Hg/L were always obtained. The retention efficiency of the bioreactor was not affected by fluctuations in inflow conductivity (between 20 and 105 mS/cm), pH (between 6.5 and 7.5), or mercury concentration (between 3 and 10 mg/L) and was between 95% and 99%. Temperature increases up to 47 degreesC did not impair bioreactor performance. Standby periods up to 6 h could be tolerated without loss in activity. A simple, effective, and robust biotechnology for remediation of mercury polluted wastewater is thus demonstrated.

Keywords: *Pseudomonas-Putida* Strain, Heavy-Metals, Contaminated Sediments, *Escherichia*-Coli, Temporal Trends, Mera Gene, Resistance, Reduction, Phytoremediation, Bioremediation

Lohmann, R., Harner, T., Thomas, G.O. and Jones, K.C. (2001), A comparative study of the gas-particle partitioning of PCDD/Fs, PCBs, and PAHs. *Environmental Science & Technology*, **34** (23), 4943-4951.

Full Text: [E\Env Sci Tec34, 4943.pdf](E/Env%20Sci%20Tec34,%204943.pdf)

Abstract: Air samples were taken concurrently for four sampling events in the winter of 1998 at three contrasting sites: an urban center and two rural sites. The rural sites were characterized by the extensive usage of coal and wood for space heating. Samples were analyzed for PCDD/Fs, PCBs, and PAHs. Recently measured octanol-air partition coefficients (K-oa) for PCDD/Fs enabled a comparison of the K-oa-based versus the subcooled liquid vapor pressure (p(L))-based partition model for all three compound classes. Both K-oa and p(L) were found to be excellent descriptors of the gas-particle partitioning of PCDD/Fs, PCBs, and PAHs. However, regressions for log K-p-log p(L) gave higher regression coefficients than for log K-p-log K-oa. Both models showed roughly similar relative states of equilibrium for PCDD/Fs, PCBs, and PAHs. PCBs were closest to equilibrium at the urban site. It is argued that newly released particles at the rural sites caused nonequilibrium partitioning at those sites for PCBs. PAHs were released at all sites and were, in line with expectations, approaching equilibrium. The K-oa-based and the p(L)-based model gave contradictory results for PCDD/Fs: according to the p(L)-model, PCDD/Fs were in equilibrium for event 1 but not for the other events, whereas the K-oa-model showed the PCDD/Fs not being in equilibrium for event 1. A simple K-oa-model, combining advective transport and locally released PCDD/Fs and PAHs, can explain the observed nonequilibrium partitioning for the first sampling event.

Keywords: Polycyclic Aromatic-Hydrocarbons, UK Urban Air, Dibenzo-p-Dioxins, Organic-Compounds, Polychlorinated-Biphenyls, Atmospheric Transport, Vapor-Pressures, Temperature, Octanol, Coefficients

Tuppurainen, K.A., Ruokojärvi, P.H., Asikainen, A.H., Aatamila, M. and Ruuskanen, J. (2001), Chlorophenols, as precursors of PCDD/Fs in incineration processes: Correlations, PLS modeling, and reaction mechanisms. *Environmental Science & Technology*, **34** (23), 4958-4962.

Full Text: [E\Env Sci Tec34, 4958.pdf](E/Env%20Sci%20Tec34,%204958.pdf)

Abstract: Emissions of organic chlorinated compounds from municipal waste incineration, in particular polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs), have been a cause of public concern for many years because of the high toxicity of these compounds. PCDD/F formation in incineration processes is being studied widely using lab-scale apparatus, but pilot-plant investigations are quite rare. The correlation between TEQ-related PCDD/Fs and chlorophenols (CIPhs) was studied here using a pilot-scale plant. The results suggest that almost all the CIPh isomers correlate strongly with PCDD/Fs in the gas phase, but only certain isomers, in particular 2, 3, 4, 6- and 2, 3, 4, 5, 6-CIPh, are of importance in the particle phase. The relationship of TEQ-related PCDD/Fs to CIPhs is so close that even predictive partial least-squares (PLS) modeling is feasible. In view of our results, some aspects of the mechanism of PCDD/F formation are discussed. From a practical point of view, the results suggest that CIPhs may be a good surrogate of TEQ-related PCDD/Fs in different incineration processes.

Keywords: Dibenzo-p-Dioxins, De-NOVO Synthesis, Municipal Waste Incinerators, Fly-Ash, Landfill Fires, Combustion, Carbon, Gas, PCDFs, Hydrocarbons

Notes: highly cited

? Bucheli, T.D. and Gustafsson, O. (2000), Quantification of the soot-water distribution coefficient of PAHs provides mechanistic basis for enhanced sorption observations. *Environmental Science & Technology*, **34** (24), 5144-5151.

Full Text: [2000\Env Sci Tec34, 5144.pdf](2000/Env%20Sci%20Tec34,%205144.pdf)

Abstract: There is an increasing recognition of the necessity to consider the heterogeneity of geosorbents, and in particular the condensed carbon facies fraction, to improve prediction of hydrophobic pollutant phase speciation. Field observations of much elevated organic-carbon normalized distribution coefficients (K-oc) of PAHs-relative to predictions from bulk organic-matter partitioning models-have been suggested to be explainable by sept sorption. To afford testing of this hypothesis, we here report on the soot-water distribution coefficients (K-sc) for a series of PAHs (naphthalene (NP), fluorene (FL), phenanthrene (PH), and pyrene (PY)) using diesel particulate matter (NIST standard reference material SRM-1650) as model soot sorbent. Specifically adapted batch and column experiments yielded average log K-sc values of 5.23, 5.40, 5.82, and 6.59 (batch) and 4.63, 6.03, 6.62, and 7.03 (column) for NP, FL, pH, and PY, respectively tall data in [L-w/kg(sc)]). The obtained values are 35-250 times higher than respective K-oc predictions and are considerably closer to theoretically estimated soot-water distribution coefficients. Our data are among the highest solid-water distribution coefficients of an environmentally relevant sorbent ever reported and lend direct empirical support of active soot sorption as a viable explanation to the enhanced PAH partitioning. Sorption kinetics on the hours-days time scale and similarity of external geometric and BET surface areas suggest that interaction sites are largely restricted to the outer surface of the soot. The constrained K-sc values facilitate prediction of speciation and bioavailable exposures of PAHs in aquatic and sedimentary environments.

Keywords: Activated Carbon, Black Carbon, Carbon, Equilibrium, Heterogeneity, Hydrophobic Organic-Chemicals, Interaction, Kinetics, Mineral Surfaces, Naphthalene, Natural Sediments, Partition-Coefficient, Partitioning, pH, Phenanthrene, Polycyclic Aromatic-Hydrocarbons, Soils, Sorption

Ribeiro, T.H., Smith, R.W. and Rubio, J. (2000), Sorption of oils by the nonliving biomass of a *Salvinia* sp. *Environmental Science & Technology*, **34** (24), 5201-5205.

Full Text: [E\Env Sci Tec34, 5201.pdf](E/Env%20Sci%20Tec34,%205201.pdf)

Abstract: The sorption of oils onto the dry biomass of the aquaphyte Salvinia sp. was studied at laboratory scale, and the results were compared to that obtained with a commercial oil sorbent, Feat Sorb, a processed neat. Studies included physical, chemical, and physicochemical characterization of the aquaphyte and the peat. The Salvinia sp. biomass was a better sorbent for oil than Feat Sorb (for a crude oil, 4.8 against 2.7 g of oil sorbed per g of biomass). Main factors that control the sorption process were the hydrophobicity of the biomass, particle size, the chemico-physical composition of the plant and the sorbate, and the capillary suction displayed by the plant biomass. The leaves of the plant, distributed primarily in the fraction greater than 1 mm, contain the majority of the hydrophobic groups, coming from microstructures (cuticular folds and wax crystal) and epicuticular wax. The capillarity may arise from both the micropores and from the interstices between hairlike surface projections, The roots, mainly the fraction less than 1 mm, contain a smaller percentage of hydrophobic groups, most of the mineral constituents lash), and higher surface area land porosity). Together, the hydrophobicity and the capillary effect due to pore structure of the plant and its parts are responsible for the oil sorption and the differences found. Technical implications of the practical use of this plant are considered in the final discussion.

Keywords: Water, Sorbents

Notes: highly cited

? Xia, G.S. and Pignatello, J.J. (2001), Detailed sorption isotherms of polar and apolar compounds in a high-organic soil. *Environmental Science & Technology*, **35** (1), 84-94.

Full Text: [2001\Env Sci Tec35, 84.pdf](2001/Env%20Sci%20Tec35,%2084.pdf)

Abstract: Sorption isotherms of 13 apolar liquids and solids and polar solids-six in unprecedented detail-are used to evaluate a polymer-based model for natural organic matter. While ail isotherms are nonlinear, the “running” Freundlich exponent n varies markedly with concentration. The isotherms show linear-scale inflection consistent with the presence of flexible (deformable) porosity as predicted by the glassy polymer-based Extended Dual-Mode Model (EDMM). The EDMM assumes dissolution and hole-filling domains in the organic solid, with provision for sorbate-caused plasticization of the solid and “melting” of the holes. Features of the EDMM are illustrated for chlorinated benzenes in poly(vinyl chloride). The solutes fall into categories of “hard” (aliphatics and 2,4-dichlorophenol) and “soft” (chlorinated benzenes, 2-chloronitrobenzene) according to their ability to plasticize organic matter. Comparison of domain coefficients at infinite dilution reveals that organic solutes have a modestly greater affinity for holes than dissolution sites (by 0.1-0.6 log unit), as expected by the polymer model. Sorption of CHCl3 shows time-dependent hysteresis diminished at high concentrations by the plasticizing effect. Sorption of CHCl3 also shows a type of hysteresis for glassy solids known as the “conditioning effect” in which high loading of sorbate increases hole population upon its removal and thus leads to enhanced uptake and nonlinearity when a second sorption is performed. A Polanyi-based, fixed-pore filling model applied to the adsorption component of the isotherms gave widely variant volumetric pore capacity, contrary to its own stipulations, and could not explain the hysteresis.

Keywords: Adsorption, Atrazine, Coals, Desorption-Kinetics, Dissolution, Distributed Reactivity Model, Equilibrium, Glass-Transition, Isotherms, Macromolecular Structure, Molecular-Structure, Sediments, Sorption

Floroiu, R.M., Davis, A.P. and Torrents, A. (2001), Cadmium adsorption on aluminum oxide in the presence of polyacrylic acid. *Environmental Science & Technology*, **35** (2), 348-353.

Full Text: [E\Env Sci Tec35, 348.pdf](E/Env%20Sci%20Tec35,%20348.pdf)

Abstract: Adsorption of metals from aqueous solution onto oxide and other surfaces is known to affect trace metal transport in many natural and engineered systems. It is therefore important to understand whether dissolved metal inputs will be easily bound to particles or will be strongly complexed in solution and transported with the water phase. The effect of poly(acrylic acid) (PAA), representing a model compound for natural organic matter, on the adsorption of Cd(II) onto gamma -Al2O3 was determined using batch adsorption experiments over a pH range from 4 to 10. Initially, interactions among the individual components were evaluated. Cadmium adsorption onto alumina showed a typical S-shaped metal adsorption curve. PAA adsorption onto gamma -Al2O3 decreased with increase in pH. The-affinity of PAA for Cd2+ increased strongly with pH. In ternary systems, the presence of PAA resulted in an enhancement of Cd(II) adsorption below pH 6, apparently due to ternary surface complex formation. Above pH 6, a decrease in cadmium adsorption onto gamma -Al2O3 was observed resulting from an increase in the concentration of soluble Cd-PAA complexes. Overall, results indicate that the presence of natural organic matter could have a significant impact on the distribution and mobility of cadmium in the environment. Simple surface complexation modeling was insufficient to describe behavior in the ternary systems due to the complexity of the PAA polymer.

Keywords: Natural Organic-Matter, Metal-Ion Binding, Fulvic-Acid, Humic Substances, Complexation, Sorption, Model, Surfaces, Equilibria, Kaolinite

Vasconcelos, M.T.S.D. and Leal, M.F.C. (2001), Adsorption and uptake of Cu by *Emiliania huxleyi* in natural seawater. *Environmental Science & Technology*, **35** (3), 508-515.

Full Text: [E\Env Sci Tec35, 508.pdf](E/Env%20Sci%20Tec35,%20508.pdf)

Abstract: Short-term kinetic experiments, carried out in natural coastal seawater (with predetermined background levels of trace metals and organic ligands, L) enriched with nitrate and phosphate, demonstrated that Emiliania huxleyi was able to uptake Cu very quickly. After 10 min of exposure (background Cu level in the inoculated cells: [Cu](total cellular) = 9.3×10-17 mol cell-1, [Cu](intracellular) = 8.4×10-17 mol cell-1, and [Cu](extracellular) = 1.0×10-17 mol cell-1) to a natural seawater which contained 29 nM total initial dissolved Cu concentration ([Cu](d)) (29 nM [CuL] and 3.2×10-13 M free Cu concentration, [Cu2+]) the intracellular Cu was already 28×10-17 mol cell-1. This value corresponded to 85% of the intracellular metal observed in pseudoequilibrium conditions (after 24 h of exposure) and to 88% of the total metal sorption (adsorption plus uptake) after 10 min. In contrast, the external adsorption after 10 min was only 3.0×10-17 mol cell-1 which corresponded to 60% of the extracellular metal in pseudoequilibrium conditions. Simultaneously occurred a very fast release of organic ligands (L) by E. huxleyi, the majority being identified by cathodic stripping voltammetry as glutathione. The production of exudates increased with both Cu concentration and exposure rime. After 10 min of exposure, the production of exudates in a medium with 129 nM [Cu](d) (72 nM [CuL] and 7.9×10-13 M [Cu2+]) was 51 nM, about 42% of that observed in pseudoequilibrium. As the Cu complexes with the organic ligands present in the medium were very stable (logarithm of the conditional stability constant: 12.18±0.06) and the ligand concentration in the medium was relatively high (e.g. 123 nM C-L in the medium with 129 nM initial [Cu](d) after 10 min of exposure) most of the metal was organically bound in the medium.

Keywords: Cathodic Stripping Voltammetry, Copper Complexation, Organic-Ligands, Heavy-Metals, Oporto Coast, Fresh-Water, Sea-Water, Speciation, Phytoplankton, Portugal

Korolewicz, T., Turek, M., Ciba, J. and Cebula, J. (2001), Speciation and removal of zinc from composted municipal solid wastes. *Environmental Science & Technology*, **35** (4), 810-814.

Full Text: [E\Env Sci Tec35, 810.pdf](E/Env%20Sci%20Tec35,%20810.pdf)

Abstract: This paper presents composting of the organic fraction of municipal solid waste containing 50000 mg/kg of cellucotton and 7980 mg/kg of zinc carried out under laboratory conditions. In the initial material as well as the compost obtained, zinc, cadmium, copper, nickel, and lead were analyzed, and their forms were determined by means of sequential extraction. It was found that 65% of zinc occurs in the organically bound form. Removal of zinc from the waste through leaching and subsequent electrochemical separation from the leaching solution was also examined. A double extraction of the waste with sodium diphosphate(V) enables a reduction of zinc content to 1240 mg/kg. As a result of electrolysis of the leaching solution, 90.2% of Zn is separated on the cathode. This paper suggests a method for processing municipal solid waste with high zinc content based on extraction of the waste with sodium diphosphate(V) and composting. The leaching solution is recovered electrochemically.

Keywords: Contaminated Soils, Heavy-Metals, Sewage-Sludge, Extraction, Forms, Acids, EDTA

Guo, L.D., Hunt, B.J., Santschi, P.H. and Ray, S.M. (2001), Effect of dissolved organic matter on the uptake of trace metals by American oysters. *Environmental Science & Technology*, **35** (5), 885-893.

Full Text: [E\Env Sci Tec35, 885.pdf](E/Env%20Sci%20Tec35,%20885.pdf)

Abstract: To examine the effects of dissolved organic matter on metal bioavailability, uptake of trace metals (Cd, Co, Hg, Cr, Ag, Zn) by American oysters (Crassostrea virginica) was compared between treatments with different dissolved organic carbon (DOC) concentrations and contrasting low molecular weight (LMW, 1 kDa) and high molecular weight (HMW, 1 kDa-0.2 mum) DOC fractions, using radiotracer techniques and short-term exposure experiments. Uptake rate constants (mL g-1 h-1) of metals, in general, increased with increasing DOC concentrations, with an initial decrease at lower DOC concentrations. Oyster dry weight concentration factors (DCF, mt g-1), determined at the end of exposure experiments (8 h), also increased for Cd, Co, Cr, Ag, and Zn, but decreased for Hg, with increasing DOC concentrations. Changes of metal uptake rate constants and DCF values with DOC concentration suggest that metal uptake pathways by American oysters vary from predominantly uptake (by diffusion of neutral) of free ionic, inorganically complexed, and LMW organic ligand complexed metals at very low DOC concentration to direct ingestion and digestion of HMW or colloidally complexed metals at higher DOC concentrations. Measured partition coefficients (K-c) between dissolved and colloidal phases were comparable between metals, ranging from 10(5.12) to 10(5.75) mL g-1. However, DCF values and uptake rate constants differed considerably between metals, with the highest DCF Values and uptake rate constants found for B-type metals, e.g., Ag, Hg, Zn, and Cd, and the lowest ones for several intermediate-type metals (e.g., Co, Cr). Metal types and thus the interaction of metals with organic ligands, such as strong complexation of B-type metals with S-containing organic ligands, may play an important role in the bioavailability and toxicity of metals to aquatic organisms. Differences in metal uptake in contrasting LMW and HMW DOC treatments suggest a generally depressed bioavailability of colloidally complexed metals at low DOC concentration (0.5 ppm) but a generally enhanced uptake at higher DOC concentrations.

Keywords: Cross-Flow Ultrafiltration, Mussel Mytilus-Edulis, Gulf-of-Mexico, Marine Bivalves, Heavy-Metals, Bioavailability, Accumulation, Toxicity, Copper, Carbon

Lagadic, I.L., Mitchell, M.K. and Payne, B.D. (2001), Highly effective adsorption of heavy metal tons by a thiol-functionalized magnesium phyllosilicate clay. *Environmental Science & Technology*, **35** (5), 984-990.

Full Text: [E\Env Sci Tec35, 984.pdf](E/Env%20Sci%20Tec35,%20984.pdf)

Abstract: A thiol-functionalized layered magnesium phyllosilicate material (called Mg-MTMS), prepared bir a direct and cost-effective cc-condensation synthesis, has been investigated as a high-capacity adsorbent for heavy metal ions. Structural characterization by powder X-ray diffraction, infrared spectroscopy, solid-state C-13 and Si-29 NMR spectroscopies, and elemental analyses confirms the smectite-type structure and the high organic moiety content of this material. Mg-MTMS was found to be highly effective far the adsorption of Hg(II), Pb(II), and Cd(III) ions, exhibiting unprecedented metal ion uptake capacities of 603, 365, and 210 mg of metal/g of adsorbent, respectively Mg-MTMS shows an equivalent affinity for the three metal ions, removing them from mixed metal solutions with an equal ion uptake capacity (similar to 400 mg of metal/g of adsorbent). Metal-loaded Mg-MTMS can be regenerated by acid treatment without altering the adsorbent properties. The high effectiveness of Mg-MTMS far the capture of metal ions is attributed to hath the high concentration of complexing thiol groups (6.4 mmol of SH/g of Mg-MTMS) and the expansion capability of the framework, which facilitates the accessibility of the binding sites.

Keywords: Hybrid Mesoporous Materials, Modified Silica-Gel, Chromatographic Concentration, Selective Adsorption, Trace-Metals, Sea-Water, Adsorbents, Monolayers, Mercury, Hg2+

Kalantzi, O.I., Alcock, R.E., Johnston, P.A., Santillo, D., Stringer, R.L., Thomas, G.O. and Jones, K.C. (2001), The global distribution of PCBs and organochlorine pesticides in butter. *Environmental Science & Technology*, **35** (6), 1013-1018.

Full Text: [E\Env Sci Tec35, 1013.pdf](E/Env%20Sci%20Tec35,%201013.pdf)

Abstract: In this study we explored the use of butter as a sampling matrix to reflect the regional and global scale distribution of PCBs and selected organochlorine pesticides/metabolites in air. This was because persistent organic pollutants (POPs) concentrate in dairy fats, where concentrations are controlled by feed intake (primarily from pasture/silage), which is in turn primarily controlled by atmospheric deposition. Butter Sigma PCB concentrations varied by a factor of similar to 60 in 63 samples from 23 countries. They were highest in European and North American butter and lowest in southern hemisphere (Australian, New Zealand) samples, consistent with known patterns of historical global usage and estimated emissions.: Concentrations in butter reflected differences in the propensity of PCB congeners to undergo long range atmospheric transport from global source regions to remote areas and the relatively even: distribution of HCB in the global atmosphere. Concentrations of p, p’-DDT, p, p’-DDE, and HCH isomers all Varied over many orders of magnitude in the butter samples, with highest levels in areas of current use (e.g. India and south/ central America far DDT, India, China, and Spain for HCH). We conclude that butter is sensitive to local, regional, and global scale spatial and temporal atmospheric trends of many POPs and may therefore provide a useful sampling medium for monitoring purposes. However, to improve the quantitative information derived on air concentrations requires an awareness of climatic and livestock management factors which influence air-milk fat-transfer processes.

Keywords: Persistent Organic Pollutants, Semipermeable-Membrane Devices, Polychlorinated-Biphenyls, Alpha-Hexachlorocyclohexane, Distribution Model, Dairy-Products, UK Atmosphere, Chemical Fate, Cows Milk, Contaminants

Celo, V., Murimboh, J., Salam, M.S.A. and Chakrabarti, C.L. (2001), A kinetic study of nickel complexation in model systems by adsorptive cathodic stripping voltammetry. *Environmental Science & Technology*, **35** (6), 1084-1089.

Full Text: [E\Env Sci Tec35, 1084.pdf](E/Env%20Sci%20Tec35,%201084.pdf)

Abstract: Adsorptive cathodic stripping voltammetry (AdCSV) in conjunction with the competing ligand-exchange method (CLEM) was investigated as a tool for measuring dissociation rate coefficients of nickel complexes in model systems. Dimethylglyoxime (DMG) was used as the competing ligand. Citric acid (CA) and a well-characterized fulvic acid (FA) were used as model ligands. The rate coefficients were calculated, and the consistency of equilibrium and kinetic data was discussed. The contributions of the disjunctive pathway (proceeding by the dissociation of the initial complex) and the adjunctive pathway (proceeding by the formation of an intermediate complex as a result of direct attack of the competing ligand on the initial complex) on the overall reactions were investigated. The reactions of Ni-CA or NI-FA complexes with DMG were demonstrated to proceed by both disjunctive and adjunctive pathways. The predominant pathway for the overall reaction depends on the nickel-to-initial ligand and the DMG-to-initial ligand ratios. The reactions follow predominantly the disjunctive pathway for [DMG] greater than or equal to 3 mM and Ni-to-dissolved organic carbon (DOC) ratios greater than 10 nM Ni2+/g of DOG. Since free nickel ion in freshwaters is reported to be toxic, its rate and pathway of formation are of environmental concern.

Keywords: Characterized Fulvic-Acid, Trace-Metal Complexation, Speciation, Competition, Titration, Ni(II), Water, Dimethylglyoxime, Dissociation, Reduction

Scheinost, A.C., Abend, S., Pandya, K.I. and Sparks, D.L. (2001), Kinetic controls on Cu and Pb sorption by ferrihydrite. *Environmental Science & Technology*, **35** (6), 1090-1096.

Full Text: [E\Env Sci Tec35, 1090.pdf](E/Env%20Sci%20Tec35,%201090.pdf)

Abstract: Metal partitioning in ferrihydrite suspensions may reach equilibrium only after a long reaction time. To determine key factors controlling the kinetics, we measured Cu and Pb uptake as a function of ferrihydrite morphology, reaction temperature, metal competition, and fulvic acid concentration over a period of 2 months. X-ray microscopy, which was used to probe ferrihydrite morphology in suspension, showed that drying irreversibly converted the gellike structure of fresh precipitate into dense aggregates. These dense aggregates sorbed Cu and Pb much slower than the gel. Temperature had a more pronounced effect on the kinetics of metal uptake by ferrihydrite gel than by dense ferrihydrite. Independently of treatment and time, Cu and Ph were bound to the ferrihydrite surface by formation of edge-sharing inner-sphere sorption complexes as confirmed by X-ray absorption fine-structure (XAFS) spectroscopy. This invariable binding mechanism, together with the observed effects of morphology and temperature, are in line with surface diffusion limiting the slow sorption process. The quantification of diffusion-limited surface sites in soils and sediments and the subsequent estimation of the effect of reaction time and temperature will be a challenge for properly predicting the fate of metals in the environment.

Keywords: Hydrous Ferric-Oxide, X-Ray-Scattering, Adsorption-Desorption, Surface-Chemistry, Structural Model, Alkaline Media, Iron-Oxides, Arsenate, Exafs, Spectroscopy

Berbel, F., Díaz-Cruz, J.M., Ariño, C., Esteban, M., Mas, F., Garcés, J.L. and Puy, J. (2001), Voltammetric analysis of heterogeneity in metal ion binding by humics. *Environmental Science & Technology*, **35** (6), 1097-1102.

Full Text: [E\Env Sci Tec35, 1097.pdf](E/Env%20Sci%20Tec35,%201097.pdf)

Abstract: The complexation of Cd, Pb, and Cu by fulvic acids at a fixed pH and ionic strength is studied by means of different voltammetric techniques at any metal-to-ligand ratio. When using Reverse Pulse Polarography (RPP) the complex species are electrochemically labile and not subject to significant electrodic adsorption. RPP titrations of fulvic acid with metal ions are interpreted on the basis of a recently proposed analytical expression for limiting currents Valid for fully labile heterogeneous complexation. The voltammetric data are transformed into the corresponding binding curve, i.e., the fraction of occupied sites vs free metal concentration. Finally, the competition between metal ions and protons in their interaction with the fulvic binding sites as well as the concomitant polyelectrolytic effects are analyzed in terms of the NICCA-Donnan model. The results show that Voltammetric techniques can be applied to the studies of heterogeneous complex systems in a broad range of metal-to-ligand ratios.

Keywords: Induced Reactant Adsorption, Polyelectrolyte Systems, Macromolecular Systems, Complexes, Acid, Coefficients, Competition, Substances, Parameters, Speciation

Notes: highly cited

? Giesy, J.P. and Kannan, K. (2001), Global distribution of perfluorooctane sulfonate in wildlife. *Environmental Science & Technology*, **35** (7), 1339-1342.

Full Text: [2001\Env Sci Tec35, 1339.pdf](2001/Env%20Sci%20Tec35,%201339.pdf)

Abstract: Here we report, for the first time, on the global distribution of perfluorooctanesulfonate (PFOS), a fluorinated organic contaminant. PFOS was measured in the tissues of wildlife, including, fish, birds, and marine mammals. Some of the species studied include bald eagles, polar bears, albatrosses, and various species of seals. Samples were collected from urbanized areas in North America, especially the Great Lakes region and coastal marine areas and rivers, and Europe. Samples were also collected from a number of more remote, less urbanized locations such as the Arctic and the North Pacific Oceans. The results demonstrated that PFOS is widespread in the environment. Concentrations of PFOS in animals from relatively more populated and industrialized regions, such as the North American Great Lakes, Baltic Sea, and Mediterranean Sea, were greater than those in animals from remote marine locations. Fish-eating, predatory animals such as mink and bald eagles contained concentrations of PFOS that were greater than the concentrations in their diets. This suggests that PFOS can bioaccumulate to higher trophic levels of the food chain. Currently available data indicate that the concentrations of PFOS in wildlife are less than those required to cause adverse effects in laboratory animals.

Su, C.M. and Puls, R.W. (2001), Arsenate and arsenite removal by zerovalent iron: Kinetics, redox transformation, and implications for in situ groundwater remediation. *Environmental Science & Technology*, **35** (7), 1487-1492.

Full Text: [E\Env Sci Tec35, 1487.pdf](E/Env%20Sci%20Tec35,%201487.pdf)

Abstract: Batch tests were performed utilizing four zerovalent iron (Fe-0) filings (Fisher, Peerless, Master Builders, and Aldrich) to remove As(V) and As(III) from water. One gram of metal was reacted headspace-free at 23 degreesC for up to 5 days in the dark with 41.5 mL of 2 mg L-1 As(V), or As(III) or As(V) + As(III) (1: 1) in 0.01 M NaCl. Arsenic removal on a mass basis followed the order: Fisher > Peerless approximate to Master Builders > Aldrich, whereas, on a surface area basis the order became: Fisher > Aldrich > Peerless approximate to Master Builders. Arsenic concentration decreased exponentially with time, and was below 0.01 mg L-1 in 4 days with the exception of Aldrich Fe-0. More As(III) was sorbed than As(V) by Peerless Fe-0 in the initial As concentration range between 2 and 100 mg L-1. No As(III) was detected by X-ray photoelectron spectroscopy (XPS) on Peerless Fe-0 at 5 days when As(V) was the initial arsenic species in the solution. As(III) was detected by XPS at 30 and 60 days present on Peerless Fe-0 when As(V) was the initial arsenic species in the solution. Likewise, As(V) was found on Peerless Fe-0 when As(III) was added to the solution. A steady distribution of As(V) (73-76%) and As(III) (22-25%) was achieved at 30 and 60 days on the Peerless Fe-0 when either As(V) or As(III) was the initial added species. The presence of both reducing species (Fe-0 and Fe2+) and an oxidizing species (MnO2) in Peerless Fe-0 is probably responsible for the coexistence of both As(V) and As(III) on Fe-0 surfaces. The desorption of As(V) and As(III) by phosphate extraction decreased as the residence time of interaction between the sorbents and arsenic increased from 1 to 60 days. The results suggest that both As(V) and As(III) formed stronger surface complexes or migrated further inside the interior of the sorbent with increasing time.

Keywords: Zero-Valent Iron, Surface-Charge Reduction, OH Release Stoichiometry, Competitive Adsorption, Subsurface Remediation, Chromate Reduction, Aqueous-Solutions, Ferrihydrite, Goethite, Oxides

Cheung, C.W., Chan, C.K., Porter, J.F. and McKay, G. (2001), Combined diffusion model for the sorption of cadmium, copper, and zinc ions onto bone char. *Environmental Science & Technology*, **35** (7), 1511-1522.

Full Text: [E\Env Sci Tec35, 1511.pdf](E/Env%20Sci%20Tec35,%201511.pdf)

Abstract: The ability of bone char to remove three single-component metals (namely, cadmium, copper and zinc) from aqueous solutions has been studied. Equilibrium isotherms have been measured and analyzed using a Langmuir isotherm model. A series of batch contact time experiments were performed to study the effect of sorbent mass and initial metal ion concentration for the three systems. A new film-pore diffusion model has been applied to the batch contact time results, and good correlation is obtained between theoretical predictions and experimental data. A further extension to the new model was made to include a surface diffusion term. The agreement between theoretical results and experimental data improved as the sum of the squares of the errors (SSE) improved by around 20% for cadmium and zinc but by 50% for copper. Therefore, the sorptions of cadmium and zinc ions onto bone char are primarily film-pore diffusion controlled, but for the copper system film-pore-surface diffusion must be considered.

Keywords: Impregnated Macroporous Resins, Activated Carbon, Pore Diffusion, Waste-Water, Metal Sorption, Heavy-Metals, Immobilized Biomass, Aqueous-Solution, Mass-Transfer, Adsorption

? Gullick, R.W. and Weber, Jr., W.J. (2001), Evaluation of shale and organoclays as sorbent additives for low-permeability soil containment barriers. *Environmental Science & Technology*, **35** (7), 1523-1530.

Full Text: [2001\Env Sci Tec35, 1523.pdf](2001/Env%20Sci%20Tec35,%201523.pdf)

Abstract: A natural share and four synthetic organoclays were compared as potential sorbent additives to containment barriers at hazardous waste sites. Trimethylphenyl ammonium bentonite (TMPA-bent) was shown in batch experiments to have the greatest sorption capacities for 1,2,4-trichlorobenzene, trichloroethylene, and methyl isobutyl ketone, followed by the share and a commercial organoclay. Sorption capacities were lowest for hexadecyltrimethyl ammonium bentonite (HDTMA-bent) and hexadecyl pyridinium bentonite (HDP-bent). Operative sorption mechanisms for the organoclays depended on the size of the organic modifier, i.e., uptake by the TMPA-bent occurred via adsorption onto mineral surfaces, while that for the HDTMA-bent and HDP-bent took place by absorption into organic phases formed by their long hydrocarbon tails. The share was found to be by far the most cost-effective sorbent, an important factor for large scale applications. Solids concentration effects (i.e., higher apparent sorption capacities at lower experimental sorbent concentrations) were exhibited by HDTMA-bent and HDP-bent. This can be attributed to aggregation of sorbent particles as a result of interactions among their hydrocarbon chains. Solids effects were observed to decline and eventually disappear as sorbent concentrations were increased. Such effects must be considered in applying batch sorption results to flow-through systems.

Keywords: Adsorption, Diffusion, Distributed Reactivity Model, Exchanged Clays, Hydrophobic Pollutants, Organic Contaminants, Sediments, Solids Concentration, Sorption, Water Partition-Coefficients

Voegelin, A., Vulava, V.M. and Kretzschmar, R. (2001), Reaction-based model describing competitive sorption and transport of Cd, Zn and Ni an acidic soil. *Environmental Science & Technology*, **35** (8), 1651-1657.

Full Text: [E\Env Sci Tec35, 1651.pdf](E/Env%20Sci%20Tec35,%201651.pdf)

Abstract: Predicting the mobility of heavy metals in soils requires models that accurately describe metal adsorption in the presence of competing cations. They should also be easily adjustable to specific soil materials and applicable in reactive transport codes. In this study, Cd adsorption to an acidic soil material was investigated over a wide concentration range (10-8 to 10-2 M CdCl2) in the presence of different background electrolytes (10-4 to 10-2 M CaCl2 or MgCl2 or 0.05 to 0.5 M NaCl). The adsorption experiments were conducted at pH values between 4.6 and 6.5. A reaction-based sorption model was developed using a combination of nonspecific cation exchange reactions and competitive sorption reactions to sites with high affinity for heavy metals. This combined cation exchange/specific sorption (CESS) model accurately described the entire Cd sorption data set. Coupled to a solute transport code, the model accurately predicted Cd breakthrough curves obtained in column transport experiments. The model was further extended to describe competitive sorption and transport of Cd, Zn, and Ni. At pH 4.6, both Zn and Ni exhibited similar sorption and transport behavior as observed for Cd. In all transport experiments conducted under acidic conditions, heavy metal adsorption was shown to be reversible and kinetic effects were negligible within time periods ranging from hours up to four weeks.

Keywords: Metal-Ion Binding, Organic-Matter, Contaminated Soils, Cadmium Sorption, Sandy Soil, pH, Calcium, Coefficients, Exchange, Kinetics

Johnson, M.D., Huang, W.L. and Weber, Jr., W.J. (2001), A distributed reactivity model for sorption by soils and sediments. 13. Simulated diagenesis of natural sediment organic matter and its impact on sorption/desorption equilibria. *Environmental Science & Technology*, **35** (8), 1680-1687.

Full Text: [E\Env Sci Tec35, 1680.pdf](E/Env%20Sci%20Tec35,%201680.pdf)

Abstract: Subcritical water treatment was used to effect rapid compositional and functional changes to peat organic matter that mimic those of the natural diagenesis process. Elemental, solid state 13C NMR, FTIR, and calorimetry analyses all indicated that the organic matter of the artificially aged peat was chemically similar to that of geologically mature coal kerogens. This paper extends the work of the previous paper in this series, which investigated the effects of subcritical water treatment of humic topsoil on subsequent phenanthrene sorption and desorption equilibria. As opposed to the previous study, however, changes in sorptive reactivity herein were unequivocally related to changes in organic matter rather than other soil constituents, and organic matter functional changes due to the simulated diagenesis were more accurately characterized. Phenanthrene sorption capacity and isotherm nonlinearity both increased with increasing degrees of artificial aging, supporting the viewpoint that hydrophobic organic contaminant sorption equilibrium properties can be directly related to the degree of diagenesis of geosorbent organic matter. In addition, this work investigated effects of subcritical water treatment of a geologically mature, kerogen-containing shale sample. In contrast to the peat, the functional characteristics of the shale were unchanged by this treatment, and subsequent phenanthrene sorption equilibria were altered far less.

Johnson, M.D., Keinath, II, T.M. and Weber, Jr., W.J. (2001), A distributed reactivity model for sorption by soils and sediments. 14. Characterization and modeling of phenanthrene desorption rates. *Environmental Science & Technology*, **35** (8), 1688-1695.

Full Text: [E\Env Sci Tec35, 1688.pdf](E/Env%20Sci%20Tec35,%201688.pdf)

Abstract: Rates and extents of phenanthrene desorption were studied for more than 250 days as functions of sorbent type, initial loading level, and aging. Apparent first-order desorption rate constants for the slowly desorbing fraction were found to (i) range from 0.00086 to 0.148 days-1 for geosorbents that contain geologically mature kerogen and less rigid humic-type soil organic matter, respectively, (II) decrease by as much as an order of magnitude with decreasing initial sorbed solid-phase phenanthrene concentration, (iii) decrease by a factor of 2 with increasing aging time for a humic topsoil but remain unaffected by aging time beyond 3 months for a shale, and (iv) be 1-2 orders of magnitude lower than rate constants for the rapidly desorbing phenanthrene fractions for any given contaminated sample. Six models were used to fit the desorption rate data. Biphasic diffusion and biphasic first-order models with three fitting parameters possess broad utility and are potentially useful in a variety of environmental applications. Disadvantages of a five-parameter triphasic first-order desorption model, a two-parameter gamma-function model, and a one- or two-parameter pore diffusion model are also discussed.

Keywords: Adsorption-Desorption, Aliphatic Halocarbons, Hydrophobic Pollutants, Natural Sediments, Nonequilibrium Sorption, Polychlorinated-Biphenyls, Polycyclic Aromatic-Hydrocarbons, Slowly Reversible Sorption, Soil Organic-Matter, Supercritical-Fluid Conditions

Trivedi, P. and Axe, L. (2001), Predicting divalent metal sorption to hydrous Al, Fe, and Mn oxides. *Environmental Science & Technology*, **35** (9), 1779-1784.

Full Text: [E\Env Sci Tec35, 1779.pdf](E/Env%20Sci%20Tec35,%201779.pdf)

Abstract: Intraparticle diffusion in microporous amorphous oxides of aluminum, iron, and manganese affects contaminant mobility and bioavailability in soils and sediments. This sorption is a lengthy process, as such, predictive methods to assess thermodynamic and transport parameters would be useful. Based on enthalpies observed in recent work, adsorption of Zn, Cd, and Sr to amorphous oxides is a physical type of reaction where the metal ions retain their waters of hydration. Consequently the adsorbate-surface interactions are a function of electrostatic forces of attraction. Accordingly, knowing the hydrated radius and the hydration number of a metal cation, a correlation is used to predict enthalpy and hence affinity. Using the resulting enthalpy and the Polanyi relation, the activation energy was evaluated for Ni a nd Ca. Th is Polanyi relationship reveals that for a given metal the activation energies with respect to these oxides are comparable. Additionally, metals of the same periodic group appear to form similar sorption complexes with a particular oxide and therefore have an equivalent Polanyi constant, alpha. Assuming a sinusoidal function describes the surface potential along the oxide surface, the surface diffusivity was predicted from the site activation theory. In this work, the predicted sorption parameters proved to be equivalent to experimental ones given the associated errors.

Keywords: Surface Complexation, Ferric-Oxide, Adsorption Affinity, Exafs Spectroscopy, Water Interfaces, Frumkin Isotherm, Pb(II) Sorption, Aluminum-Oxides, Hydrated Oxides, Ions

Tan, P., Hurtado, I., Neuschutz, D. and Eriksson, G. (2001), Thermodynamic modeling of PCDD/Fs formation in thermal processes. *Environmental Science & Technology*, **35** (9), 1867-1874.

Full Text: [E\Env Sci Tec35, 1867.pdf](E/Env%20Sci%20Tec35,%201867.pdf)

Abstract: Three thermodynamic databases of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/Fs), derived using the Group Additivity approach and two computational molecular modeling methods, Modified Neglect of Diatomic Overlap (MNDO) and Parametrized Model 3 (PRM), respectively, combined with the Scientific Group Thermodata Europe (SGTE) database have been used to model the formation of PCDD/Fs in thermal processes, such as iron ore sintering process. The predictions using the three different databases are compared, and similar thermodynamic conditions of PCDD/Fs formation are found. The comparison of the calculated values with measured results obtained from industrial iron ore sinter plant indicates that the PCDDs and PCDFs found in practice are not in equilibrium with each other. While within each dioxin and furan homologue equilibrium between the isomers appears to be established in industrial processes, reactions between dioxins and furans seem to be kinetically inhibited. This view has been supported by assuming no reaction at all between PCDFs and PCDDs in the simulation. With this assumption, both PCDFs and PCDDs reached partial pressures between 600 and 800 K in the order of magnitude actually found in practice. Taking this restriction into account, the conditions for PCDD/Fs formation were calculated as a function of oxygen partial pressure, temperature, concentrations of carbon, hydrogen, and chlorien, and C/H ratio.

Keywords: Dibenzo-Para-Dioxins, Municipal Waste Incinerators, De-Novo Reactions, Fly-Ash, Gas-Phase, Prediction, PCDD/PCDF, Decomposition, Enthalpy, Rates

Masunaga, S., Yao, Y., Ogura, I., Nakai, S., Kanai, Y., Yamamuro, M. and Nakanishi, J. (2001), Identifying sources and mass balance of dioxin pollution in Lake Shinji Basin, Japan. *Environmental Science & Technology*, **35** (10), 1967-1973.

Full Text: [E\Env Sci Tec35, 1967.pdf](E/Env%20Sci%20Tec35,%201967.pdf)

Abstract: On the basis of congener specific analysis of dioxins in a dated sediment core, the sources and behavior of dioxins in Lake Shinji Basin, Japan, were estimated. The dioxins in the core showed that their deposition in the lake increased rapidly during the 1960s, peaked in the early 1970s, and then decreased gradually. Principal component analysis of the congener specific date showed that three major sources-existed: pentachlorophenol (PCP), chloronitrophen (CNP), and combustion. PCP and CNP are paddy field herbicides used extensively in the basin. The time trends of source contributions were estimated by multiple regression analysis using the source profiles. The results revealed that dioxin emission from PCP and CNP herbicides was high in the 1960s and the,early 1970s, respectively. The contributions from PCP, CNP, and combustion in recent surface sediment were about 68, 16, and 16% in terms of total-amount of dioxins. From the decreasing trend of dioxin deposition in the lake after extensive herbicide use, the amount of dioxins that accumulated in the agricultural soil in the basin was estimated to have decreased by about 2%/yr ora half-life of about 35 yr, indicating that dioxin runoff from agricultural fields would continue for a long time.

Keywords: Dibenzo-p-Dioxin, British-Columbia, Sediments, Emissions, Patterns, Soils

Green, N.J.L., Jones, J.L., Johnston, A.E. and Jones, K.C. (2001), Further evidence for the existence of PCDD/Fs in the environment prior as 1900. *Environmental Science & Technology*, **35** (10), 1974-1981.

Full Text: [E\Env Sci Tec35, 1974.pdf](E/Env%20Sci%20Tec35,%201974.pdf)

Abstract: PCDD/Fs and PCBs have been analyzed in a series of archived soil samples collected from various depths during the 1800s and early 1900s. PCBs were not found in soil samples collected before 1900, whereas PCDD/Fs were present in concentrations between 43 and 110 pg/g in surface soils, and between 9 and 150 pg/g in soils collected from below the surface. The PCDD/F homologue patterns of all surface soils were consistent with each other. The homologue pattern of deeper soils altered with depth to one that was dominated by highly chlorinated PCDDs. The highest Sigma (4-8)PCDD/F concentration (150pg/g) was found in the deepest soil analyzed (230-250 cm below the surface). The cork from one of the storage bottles contained considerable quantities of both PCBs and PCDD/Fs. However, contamination of the soils, either by diffusion through the cork or by cork particles, was discounted on the basis that no PCBs were evident in the soil, and that the PCDD/F homologue pattern in the cork was Very different to that found in the soil. Similar arguments were used to discount contamination of the soil by dust. A sample of ashed vegetation from the archive, that had no cork stopper, contained high concentrations of PCBs (78 ng/g), concentrations of mono- to tri-CDFs that were higher than in any of the soils (190 pg/g), but very low concentrations of Sigma (4-8)PCDD/F (12 pg/g). This pattern of analytes was considered to be representative of contamination from store room air and was completely different from the pattern observed in the soils. Taken together these observations indicate that contamination during storage, or subsequent handling, is unlikely to have occurred in archived soil samples that were stored with cork and wax seal intact. The results imply surface soil Sigma (4-8)PCDD/F concentrations of around 60 pg/g at Rothamsted (southeast England) in the late 1800s, compared with similar to 300 pg/g reported for rural UK soils in the 1990s.

Keywords: Temporal Trends, Soil, Sediments, UK

Hug, S.J., Canonica, L., Wegelin, M., Gechter, D. and Von Gunten, U. (2001), Solar oxidation and removal of arsenic at circumneutral pH in iron containing waters. *Environmental Science & Technology*, **35** (10), 2114-2121.

Full Text: [E\Env Sci Tec35, 2114.pdf](E/Env%20Sci%20Tec35,%202114.pdf)

Abstract: An estimated 30-50 million people in Bangladesh consume groundwater with arsenic contents far above accepted limits. A better understanding of arsenic redox kinetics and simple water treatment procedures are urgently needed. We have studied thermal and photochemical As(III) oxidation in the laboratory, on a time scale of hours, in water containing 500 µg/L As(III), 0.06-5 mg/L Fe(II, III), and 4-6 mM bicarbonate at pH 6.5-8.0. As(V) was measured colorimetrically, and As(III) and As(tot) were measured by As(III)/As(tot)-specific hydride-generation AAS. Dissolved oxygen and micromolar hydrogenperoxide did not oxidize As(III) on a time scale of hours. As(III) was partly oxidized in the dark by addition of Fe(II) to aerated water, presumably by reactive intermediates formed in the reduction of oxygen by Fe(II). In solutions containing 0.06-5 mg/L Fe(II, III), over 90% of As(III) could be oxidized photochemically within 2-3 h by illumination with 90 W/m2 UV-A light. Citrate, by forming Fe(III) citrate complexes that are photolyzed With high quantum yields, strongly accelerated As(III) oxidation. The photoproduct of citrate (3-oxoglutaric acid) induced rapid flocculation and precipitation of Fe(III). in laboratory/tests, 80-90% of total arsenic was removed after addition of 50 µM citrate or 100-200 µL (4-8 drops) of lemon juice/L, illumination for 2-3 h, and precipitation. The same procedure was able to remove 45-78% of total arsenic in first field trials in Bangladesh.

Keywords: Hydroxyl Radicals, Adsorbed Arsenate, Aqueous-Solution, Ferric-Chloride, Fenton Reaction, Surface Waters, Rate Constants, Groundwater, Complexes, Bangladesh

Fortin, C. and Campbell, P.G.C. (2001), Thiosulfate enhances silver uptake by a green alga: Role of anion transporters in metal uptake. *Environmental Science & Technology*, **35** (11), 2214-2218.

Full Text: [E\Env Sci Tec35, 2214.pdf](E/Env%20Sci%20Tec35,%202214.pdf)

Abstract: Short-term (<1 h) silver uptake by the, green alga Chlamydomonas reinhardtii was measured in the laboratory in defined inorganic media in the presence or absence of ligands (chloride and thiosulfate). In contradiction to the free-ion model of metal uptake, silver accumulation by the alga proved to be sensitive to the choice of ligand used to buffer the free silver concentration. For a low fixed free Ag+ concentration of 10 nM, silver uptake in the presence of thiosulfate (0.11 μM) was 2x greater than in the presence of chloride (4 mM). When sulfate was removed from the exposure medium (i.e., 81 µM --> 0 µM), sliver uptake in the presence of thiosulfate was even more markedly enhanced (more than 4x greater than in the presence of chloride). Varying the sulfate concentration in the exposure medium only affected silver uptake if thiosulfate was present. We conclude that silver-thiosulfate complexes are transported across the plasma membrane via sulfate/thiosulfate transport systems and that sulfate acts as a competitive inhibitor of this uptake mechanism.

Keywords: Water Rainbow-Trout, Selenastrum-Capricornutum, Chlamydomonas-Reinhardtii, Sulfate Transport, Pore Waters, Toxicity, Cadmium, Copper, Zinc, Iron

Kim, C., Zhou, Q.H., Deng, B.L., Thornton, E.C. and Xu, H.F. (2001), Chromium(VI) reduction by hydrogen sulfide in aqueous media: Stoichiometry and kinetics. *Environmental Science & Technology*, **35** (11), 2219-2225.

Full Text: [E\Env Sci Tec35, 2219.pdf](E/Env%20Sci%20Tec35,%202219.pdf)

Abstract: The objective of this work was to investigate the reaction stoichiometry, kinetics, and mechanism for Cr(VI) reduction by hydrogen sulfide in the aqueous phase. Batch experiments with excess [Cr(VI)] over [H2S](inverted perpendicular) indicated that the molar amount of sulfide required for the reduction of 1 M Cr(VI) was 1.5, suggesting the following stoichiometry: 2CrO42- + 3H2S + 4H+ -> 2Cr(OH)3(s) + 3S(s) + 2H2O. Further study with transmission electron microscopy (TEM) and energy-dispersive X-ray spectroscopy (EDS) confirmed that chromium hydroxide and elemental sulfur were the stable products. The kinetics of Cr(VI) reduction by hydrogen sulfide was measured under various initial concentrations of Cr(VI) and sulfide as well as pH values controlled by HEPES, phosphate, and berate buffers. Results showed that the overall reaction was second-order, i.e., first-order with respect to Cr(VI): and first-order to sulfide. The reaction rate increased as pH was decreased, and the pH dependence correlated well with the fraction of fully protonated sulfide (H2S) in the pH range of 6.5-10. The nature of buffers did not influence the reaction rate significantly in the homogeneous system. The reaction kinetics could be interpreted by a three-step mechanism: formation of an inner-sphere chromate-sulfide intermediate complex ({H2O4CrVIS}2-), intramolecular electron transfer to form Cr(IV) species, and subsequent fast reactions leading to Cr(III).

Keywords: In-Situ Remediation, Chromate Reduction, Ferrous Iron, Cr(VI), Oxidation, Biotite, Samples, Soils, Acid, Transformations

Buehler, S.S., Basu, I. and Hites, R.A. (2001), A comparison of PAH, PCB, and pesticide concentrations in air at two rural sites on Lake Superior. *Environmental Science & Technology*, **35** (12), 2417-2422.

Full Text: [E\Env Sci Tec35, 2417.pdf](E/Env%20Sci%20Tec35,%202417.pdf)

Abstract: Atmospheric concentrations of polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and pesticides were compared at Brule River and Eagle Harbor, two rural sites on Lake Superior that are part of the Integrated Atmospheric Deposition Network (IADN). Brule River lies 40 km southwest of Duluth, MN, a small industrial city, and Eagle Harbor is in Michigan’s upper peninsula, 400 km east of Brule River. Pesticide and PCB concentrations were similar at both sites. Day-by-day regression analyses of the data showed that PAH concentrations, an indication of urban contamination, were significantly higher at Brule River than at Eagle Harbor. Concentration ranges for all compounds at both sites were well within global background levels, despite the differences observed between the two sites. Clearly, pollution from Duluth is influencing PAH concentrations at Brule River more than at Eagle Harbor.

Keywords: Polycyclic Aromatic-Hydrocarbons, Semivolatile Organic-Compounds, UK Urban Air, Great-Lakes, Polychlorinated-Biphenyls, Temporal Trends, Temperature-Dependence, Atmospheric Concentrations, Long-Term, Michigan

Christl, I. and Kretzschmar, R. (2001), Relating ion binding by fulvic and humic acids to chemical composition and molecular size. 1. Proton binding. *Environmental Science & Technology*, **35** (12), 2505-2511.

Full Text: [E\Env Sci Tec35, 2505.pdf](E/Env%20Sci%20Tec35,%202505.pdf)

Abstract: Proton binding by a soil fulvic acid, humic acid, and a set of size fractions of the humic acid was studied as a function of pH acid ionic strength by potentiometric titrations. The negative charge of the humic substances resulting from deprotonation of acidic functional groups generally increased with increasing pH and increasing ionic strength. At any given pH acid ionic strength, the fulvic acid fraction exhibited much higher negative charge than the humic acid fraction. For the size-fractionated humic acids, negative charge decreased steadily with increasing apparent molecular weight, as determined by size exclusion chromatography. Observed differences in proton binding by the various humic substances corresponded well to differences in functional group composition, which has been extensively characterized in a previous study using a combination of analytical techniques. The proton binding behavior of the humic substances was described very well by the consistent NICA-Donnan model. However, when all adjustable model parameters were determined using a least-squares minimization technique without introducing parameter constraints, the values of some parameters turned out physically and chemically unreasonable. Therefore, we propose to derive some model parameters from chemical characterization results obtained by size exclusion chromatography and solid-state C-13 NMR spectroscopy. Using this approach, we obtained excellent descriptions of all titration data, and the model parameter values were more consistent and chemically reasonable, Our results demonstrate that characterization results of humic substances can be used in NICA-Donnan modeling to reduce the number of free fitting parameters without arbitrary constraints and, thereby, obtaining a more reliable database for environmental modeling.

Keywords: Natural Organic-Matter, Nica-Donnan Model, Substances, Complexation, Heterogeneity, Competition, Soil

Christl, I., Milne, C.J., Kinniburgh, D.G. and Kretzschmar, R. (2001), Relating ion binding by fulvic and humic acids to chemical composition and molecular size. 2. Metal binding. *Environmental Science & Technology*, **35** (12), 2512-2517.

Full Text: [E\Env Sci Tec35, 2512.pdf](E/Env%20Sci%20Tec35,%202512.pdf)

Abstract: Binding of Cu(II) and Pb(II) to a soil fulvic acid, humic acid, and two different size fractions of the humic acid was investigated with metal titration experiments at pH 4, 6, and 8. Proton and free metal ion activities in solution were monitored after each titration step using pH and ion selective electrodes (ISE), respectively. The amounts of base required to maintain constant pH conditions were recorded and used to calculate stoichiometric proton-to-metal ion exchange ratios. Despite clear differences in chemical composition and protonation behavior, the fulvic acid and all humic acid fractions exhibited very similar metal binding behavior. Binding of Cu(II) and Pb(II) generally increased with increasing pH and total metal concentration. At low to moderate metal ion concentrations, Cu(II) was bound more strongly to the humic substances than Pb(II). Only at high free metal concentrations, the amounts of metal ions sorbed were higher for Pb(II) than for Cu(II). The molar proton-to-metal ion exchange ratios ranged from 1.0 to 1.8 for Cu(II) and from 0.6 to 1.2 for Pb(II), suggesting that Cu(II) was bound as monodentate and bidentate complexes, while Pb(II) was bound predominantly as monodentate complexes. The metal ion binding data were quantitatively described with the consistent NICADonnan model. The best description of an entire multicomponent data set consisting of proton titration, Cu(II), and Pb(II) binding data was achieved when the entire data set was fitted simultaneously. To reduce the number of fitting parameters, results from size exclusion chromatography and solid state C-13 NMR spectroscopy were used to estimate two of the NICA-Donnan model parameters. The values of the remaining NICA-Donnan parameters for the humic substances are within a narrow range, suggesting that generalized model parameters may be useful in geochemical modeling involving humic substances.

Keywords: Natural Organic-Matter, Selective Electrode, Proton Binding, Model, Complexation, Competition, Cadmium(II), Substances, Lead(II), Soil

Berg, M., Tran, H.C., Nguyen, T.C., Pham, H.V., Schertenleib, R. and Giger, W. (2001), Arsenic contamination of groundwater and drinking water in Vitnam: A human health threat. *Environmental Science & Technology*, **35** (13), 2621-2626.

Full Text: [E\Env Sci Tec35, 2621.pdf](E/Env%20Sci%20Tec35,%202621.pdf)

Abstract: This is the first publication on arsenic contamination of the Red River alluvial tract in the city of Hanoi and in the surrounding rural districts. Due to naturally occurring organic matter in the sediments, the groundwaters are anoxic and rich in iron. With an average arsenic concentration of 159 µg/L, the contamination levels varied from 1 to 3050 µg/L in rural groundwater samples from private small-scale tubewells. In a highly affected rural area, the groundwater used directly as drinking water had an average concentration of 430 µg/L. Analysis of raw groundwater pumped from the lower aquifer for the Hanoi water supply yielded arsenic levels of 240-320 µg/L in three of eight treatment plants and 37-82 µg/L in another five plants. Aeration and sand filtration that are applied in the treatment plants for iron removal lowered the arsenic concentrations to levels of 25-91 µg/L, but 50% remained above the Vietnamese Standard of 50 µg/L. Extracts of sediment samples from five bore cores showed a correlation of arsenic and iron contents (r2 = 0.700, n = 64). The arsenic in the sediments may be associated with iron oxyhydroxides and released to the groundwater by reductive dissolution of iron. Oxidation of sulfide phases could also release arsenic to the groundwater, but sulfur concentrations in sediments were below 1 mg/g. The high arsenic concentrations found in the tubewells (48% above 50 µg/L and 20% above 150 µg/L) indicate that several million people consuming untreated groundwater might be at a considerable risk of chronic arsenic poisoning.

Keywords: Ganges Delta, United-States, Water, Bangladesh, Mobilization

Fábrega, J.R., Jafvert, C.T., Li, H. and Lee, L.S. (2001), Modeling competitive cation exchange of aromatic amines in water-saturated soils. *Environmental Science & Technology*, **35** (13), 2727-2733.

Full Text: [E\Env Sci Tec35, 2727.pdf](E/Env%20Sci%20Tec35,%202727.pdf)

Abstract: Competitive association to several components of sail through ion exchange processes influences the fate of organic cations in the environment. To examine these processes, the distributions of aniline and 1-aminonaphthalene between aqueous 5 mM CaCl2 solutions and three different Indiana soils were evaluated. Solute ratios (Sr) of aniline to 1-aminonaphthalene of 0.4-4.7 were employed, and the soil solutions ranged in pH from 2.7 to 7.5, with all measurements made 24 h after the introduction of the chemicals to the soils. Two previously proposed equilibrium models - the two-site (TS) and distributed parameter (DP) models - were modified to predict competition. These models assume instantaneous equilibrium of the following reversible processes: (i) acid dissociation of the protonated organic base (BHaq+) in the aqueous phase, (II) ion exchange on the soil between the protonated organic base and inorganic divalent cations (DXaq2+ = Ca-aq(2+) + Mg-aq(2+)), and (iii) partitioning of the nonionic species of aniline (B-aq) to soil organic carbon. The TS model is a general mass action model that does not take into consideration cation exchange site heterogeneity, whereas the DP model considers association constants to these sites to be distributed in a log-normal fashion. To describe competition for cation exchange sites within the DP model, it was necessary to add a correlation coefficient (rho) that relates the ion-exchange association constant (K-BH) probability density distribution functions of the two compounds. The value of rho is characteristic of each soil. Results indicate that competition has a greater effect at low pH values, where ion exchange is the predominant process. For all cases, these models capture the general trends in the soil-water distribution data of both amines. The DP model also captures the nonlinearity of the 1-aminonaphthalene isotherms at low pH while at the same time capturing the nearly linear isotherms of aniline as a competing organic base.

Keywords: Adsorption Equilibria, Sorption

Ko, D.C.K., Porter, J.F. and McKay, G. (2001), Determination of solid-phase loading for the removal of metal ion from effluents using fixed-bed adsorbers. *Environmental Science & Technology*, **35** (13), 2797-2803.

Full Text: [E\Env Sci Tec35, 2797.pdf](E/Env%20Sci%20Tec35,%202797.pdf)

Abstract: The sorption of cadmium and copper ions from aqueous solutions onto bone char using fixed-bed adsorbers has been studied. A film-pore diffusion model has been utilized to predict theoretical breakthrough curves, which are compared with experimental breakthrough curves by means of error analysis. The key parameters for correlating the theoretical model are the external film mass-transfer coefficient (kf), the effective diffusion coefficient (Deff), and the solid-phase loading (q). The kf is determined from fixed-bed empirical correlations, and Deff is determined by a best-fit optimization routine. The q value has traditionally been determined using the equilibrium isotherm, which is applicable when the column adsorbent reaches equilibrium, or using the breakthrough curve mass balance when the column does not reach equilibrium. The breakthrough curve mass balance method needs experimental curves for each system and is not a practical solution for general design models. This paper presents two novel predictive equations for q in terms of process variables. The accuracy of the equations is sufficient for application in design models for nonequilibrium and equilibrium systems.

Keywords: Mass-Transfer, Adsorption Systems, Activated Carbon, Predictive Model, Design, Parameters, Batch, Optimization, Diffusion, Transport

Kishimoto, A., Oka, T., Yoshida, K. and Nakanishi, J. (2001), Cost effectiveness of reducing dioxin emissions from municipal solid waste incinerators in Japan. *Environmental Science & Technology*, **35** (14), 2861-2866.

Full Text: [E\Env Sci Tec35, 2861.pdf](E/Env%20Sci%20Tec35,%202861.pdf)

Abstract: The main sources of dioxin emissions are municipal solid waste incinerators. The Japanese national government has set an emission standard for dioxins to reduce dioxin exposure levels. In this study, cost-effectiveness analyses are carried out regarding countermeasures that were recently taken and are being taken at municipal solid waste incinerators in Japan. Annual costs were estimated by telephone survey and model calculations. Annual decrease in the incidence of cancer was estimated in three steps. First, the annual decrease in the volume of dioxin emissions was estimated. Next, using a mathematical model, the annual decrease in human exposure was estimated. Finally, the annual decrease in the incidence of cancer was estimated by applying the cancer slope factor. When annual costs are divided by the annual number of life-years saved, cost per life-year saved (CPLYS) was obtained. CPLYS was estimated to be 7.9 million yen for emergency countermeasures and 150 million yen for long-term countermeasures. However, it must be noted that these obtained CPLYSs are highly dependent on the cancer slope factor and should be considered as an upper limit since there may be a cancer effect threshold.

Green, N.J.L., Jones, J.L. and Jones, K.C. (2001), PCDD/F deposition time trend to Esthwaite Water, UK, and its relevance to sources. *Environmental Science & Technology*, **35** (14), 2882-2888.

Full Text: [E\Env Sci Tec35, 2882.pdf](E/Env%20Sci%20Tec35,%202882.pdf)

Abstract: PCDD/Fs were measured in 16 sections of a sediment core from a freshwater lake in rural England. Each section represented 10 yr of deposition. Concentrations greater than the limit of detection were observed for most homologues in all samples. Three eras of PCDD/F input were identified by their distinct homologue and isomer profiles. Sigma (4-8)CDD/F levels in core sections deposited before 1900 were in the order of 100 pg/g dry weight (dw) as compared to 1500 pg/g dw in the most recently deposited sediment. Local industries such as mining, quarrying, charcoal burning, and iron smelting appear to have had a minor impact oh the PCDD/F deposition in the lake. Since 1900, two major peaks in PCDD/F input to the lake were evident. The first, reaching a maximum in the 1930s, had an unusual homologue pattern dominated by high molecular weight PCDFs, and the source of this input is unknown. The second, with a maximum in the 1970s, is in keeping with previously reported time trends for Europe and North America. Pre-1900, the TCDD/F isomer pattern was dominated by dimerization products of 2,4-dichlorophenol. Concentrations of P((1-3))CDFs appeared to be connected with the input that peaked in the 1030s, while highest concentrations of P((1-3))CDDs were found in the deepest sediment sections. Concentrations of diCDDs were observed to have increased again over the most recent decades to levels similar to pre-1900 sections. Despite detailed knowledge of the catchment and of industry in the surrounding area, the identity of some sources and the contribution of other known sources remain unclear for each era. This indicates that there remain significant gaps in our understanding of PCDD/F sources and undermines our ability to predict future trends in PCDD/F emissions.

Keywords: Dibenzo-p-Dioxins, Dated Lake-Sediments, Magnetic-Susceptibility, PCDF, Profile, Pattern, Germany, Forest, Record, Fluxes

Anthony, E.J., Jia, L. and Granatstein, D.L. (2001), Dioxin and furan formation in FBC boilers. *Environmental Science & Technology*, **35** (14), 3002-3007.

Full Text: [E\Env Sci Tec35, 3002.pdf](E/Env%20Sci%20Tec35,%203002.pdf)

Abstract: Fluidized bed combustion (FBC) is increasingly being used for municipal solid waste incineration and for various applications in which dioxin and furan (PCDD/F) formation are concerns. Despite the fact that fluidized bed combustion is a relatively low temperature system, current evidence shows that they perform relatively well. One hypothesis is that sulfur, which is contained in some of the fuels used in FBC (e.g. coal in cofiring situations), helps to reduce dioxin production. This paper endeavors to examine this speculation and finds that such benefits depend on the CI/S ratio and that at higher sulfur addition levels dioxins, furans, and polycyclic aromatic hydrocarbon (PAH) production may actually increase. This and the reasons for it are discussed.

Keywords: Waste Combustion, Emissions

Romero-Gonzalez, M.E., Williams, C.J. and Gardiner, P.H.E. (2001), Study of the mechanisms of cadmium biosorption by dealginated seaweed waste. *Environmental Science & Technology*, **35** (14), 3025-3030.

Full Text: [E\Env Sci Tec35, 3025.pdf](E/Env%20Sci%20Tec35,%203025.pdf)

Abstract: The ability of dealginated seaweed waste, a waste material derived from the commercial processing of seaweed for alginate production, to remove cadmium from solution was determined. Cadmium sorption was found to be rapid (91% removal within 5 min), achieving a residual concentration of 0.8 mg L-1 after 1-h contact time from an initial solution concentration of 10 mg L-1 The binding of cadmium by dealginate was found to be pH dependent, optimal sorption occurring at around pH 6-8. The mechanism of cadmium ion binding by dealginate was investigated by a number of techniques. Potentiometric titration of the dealginate revealed two distinct pK(a) values, the first having a value similar to carboxyl groups and the second comparable with that of saturated thiols and amines. Esterification of the dealginate resulted in the subsequent reduction in cadmium sorption (95% to 17%), indicating that carboxyl groups are largely responsible for sorption. Evidence from FT-IR spectra confirmed the presence of carboxyl groups in untreated dealginate, while the number of carboxyl groups was markedly reduced in the esterified sample. Furthermore, the FT-IR spectrum for dealginate was found to be similar to that previously reported for mannuronic acid-rich calcium alginate. Determination of a molar ratio in the displacement of calcium by cadmium on dealginate further supported the presence of an ion-exchange relationship. The ion-exchange constant was calculated to be 0.329×10-6. The speciation of cadmium in solution both before and after sorption was determined by an ion-selective electrode (ISE)technique. The findings of this study suggest that the sorption of cadmium by dealginate is mainly due to an ion-exchange mechanism.

Keywords: Heavy-Metals, Ion Binding, Alginate, Removal, Speciation, Biomass

Beolchini, F., Pagnanelli, F. and Vegliò, F. (2001), Modeling of copper biosorption by *Arthrobacter* sp. in a UF/MF membrane reactor. *Environmental Science & Technology*, **35** (14), 3048-3054.

Full Text: [E\Env Sci Tec35, 3048.pdf](E/Env%20Sci%20Tec35,%203048.pdf)

Abstract: Copper biosorption by Arthrobacter sp. has been studied in this work. The process has been realized inside of a ultrafiltration/microfiltration (UF/MF) reactor in order to confine cells. A mathematical model has been developed that is able to predict experimental data under different operating conditions. The model takes into account different phenomena, which might occur during the process, such as a dependence of equilibrium parameters on pH, a partial cell disruption, and a change in the membrane retention properties at high biomass concentrations. Experimental tests have been performed under different operating conditions: a full factorial design has been implemented with pH (levels: 4, 5, and 6 units) and biomass concentration (levels: 1 and 5 g/L) as factors. A simple mathematical model based on metal mass balance taking into account the effect of pH on the Langmuir equilibrium adsorption parameters well fitted experimental data at low pH values and biomass concentrations. A more complex mathematical model, which considers a partial cell disruption during the biosorption trial, was proposed to understand and analyze the anomalous system behavior at pH = 6 and biomass concentration equal to 5 g/L. The effect of mechanical stress on biomass performances was also examined by using a discontinuous system (test tube trials) simulating the membrane reactor apparatus. In this alternative system biosorption trials were carried out in test tubes in such a way to avoid or at least minimize the disruption due to mechanical stress. Experimental results obtained by using this system can be modeled up to pH = 5 without considering cell disruption phenomenon, while at pH = 6 possible chemical reactions of biomass constituents could happen.

Keywords: Positive Soil Bacterium, Isolated Cell-Walls, Marine-Algae, Biomass, Metals, Cadmium, Seaweed, Matrix

Iino, F., Tsuchiya, K., Imagawa, T. and Gullett, B.K. (2001), An isomer prediction model for PCNs, PCDD/Fs, and PCBs from municipal waste incinerators. *Environmental Science & Technology*, **35** (15), 3175-3181.

Full Text: [E\Env Sci Tec35, 3175.pdf](E/Env%20Sci%20Tec35,%203175.pdf)

Abstract: Isomer patterns of polychlorinated naphthalenes (PCNs), polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated biphenyls (PCBs), and polychlorinated dibenzofurans (PCDFs) from municipal waste incinerators (MWIs) were predicted by a model based on symmetry numbers and preferential chlorination positions. Fly ash isomer patterns from five stoker and seven fluidized bed incinerators were compared to validate the prediction model. The isomer patterns of the highly chlorinated PCN homologues from stoker type incinerators were successfully predicted. The relative equilibrium concentrations of tetrachloronaphthalenes (TeCNs), calculated by an ab initio method, cannot explain the field isomer patterns. Formation pathways involving chlorophenol precursor condensation reactions should be examined to see whether these isomer patterns provide a better fit to the field PCDD data. The PCB isomer patterns were fit reasonably well, but this finding could merely be an artifact of the limited data and the large number of isomers. The prediction equations of PCDFs, revised from prior work to include a symmetry number for each isomer, represented the field data patterns for the higher chlorinated isomers very well. Successful prediction of isomer patterns for partial homologue ranges suggests that these patterns are determined by a mechanism governed by Cl-position-specific preferences.

Keywords: Dibenzo-p-Dioxins, DE-NOVO Synthesis, Polychlorinated Naphthalenes, Fly-Ash, Coplanar PCBs, PCDFs, Mechanism, Patterns, Samples, Japan

Wilson, A.R., Lion, L.W., Nelson, Y.M., Shuler, M.L. and Ghiorse, W.C. (2001), The effects of pH and surface composition of Pb adsorption to natural freshwater biofilms. *Environmental Science & Technology*, **35** (15), 3182-3189.

Full Text: [E\Env Sci Tec35, 3182.pdf](E/Env%20Sci%20Tec35,%203182.pdf)

Abstract: Two dominant variables that control the adsorption of toxic trace metals to suspended particulate materials and aquatic surface coatings are surface composition and solution pH. A model for the pH-dependent adsorption of Pb to heterogeneous particulate surface mixtures was derived from experimental evaluation of Pb adsorption to laboratory-derived surrogates. The surrogate materials were selected to represent natural reactive surface components. Pb adsorption to both the laboratory surrogates and natural biofilms was determined in chemically defined solutions under controlled laboratory conditions. Pb adsorption was measured over a pH range of 5-8, with an initial Pb concentration in solution of 2.0 muM. The surface components considered include amorphous Fe oxide, biogenic Mn oxide produced by a Mn(II) oxidizing bacterium (Leptothrix discophora SS-1), Al oxide, the common green alga *Chlorella vulgaris*, and Leptothrix discophora SS-1 cells. A linearization of Pb adsorption da ta for each adsorbent was used to quantify the relationship between Pb adsorption and pH. The parameters for individual adsorbents were incorporated into an additive model to predict the total Pb adsorption in multiple-adsorbent natural surface coatings that were collected from Cayuga Lake, NY. Pb adsorption experiments on the natural surface coatings at variable pH were utilized to verify the additive model predictions based on the pH dependent behavior of the experimental laboratory surrogates. Observed Pb adsorption is consistent with the model predictions (within 1-24%) over the range of solution pH values considered. The experimental results indicate that the combination of Fe and biogenic Mn oxides can contribute as much as 90% of Pb adsorbed on Cayuga Lake biofilms, with the dominant adsorbent switching from Mn to Fe oxide with increasing pH.

Keywords: Trace-Metals, Suspended Particles, Microbial Oxidation, Particulate Matter, Manganese, Iron, Oxide, Lead, Discophora, Deposition

? Tolls, J. (2001), Sorption of veterinary pharmaceuticals in soils: A review. *Environmental Science & Technology*, **35** (17), 3397-3406.

Full Text: [2001\Env Sci Tec35, 3397.pdf](2001/Env%20Sci%20Tec35,%203397.pdf)

Abstract: Veterinary pharmaceuticals (VPs) are used in large amounts in modern husbandry. Due to their use pattern, they possess a potential for reaching the soil environment. To assess their mobility in soil, the literature on sorption of chemicals used as VPs is reviewed and put into perspective of their physicochemical properties. The compilation of sorption coefficients to soil solids (K-d,K-solid) demonstrates that these chemicals display a wide range of mobility (0.2 < K-d,K-solid < 6000 L/kg). Partition coefficients for association of tetracycline and quinolone carboxylic acid VPs to dissolved organic matter (K-d,K-Dom) vary between 100 and 50 000 L/kg. The variation in K-d,K-solid for a given compound in different soils can be significant. For most of the compounds, the variation is not considerably lower for the organic carbon-normalized sorption coefficient K-oc. In addition, prediction of log K-oc by log K-ow leads to significant underestimation of log K-oc and log K-d,K-DOM values. This suggests that mechanisms other than hydrophobic partitioning play a significant role in sorption of VPs. A number of hydrophobicity-independent mechanisms such as cation exchange, cation bridging at clay surfaces, surface complexation, and hydrogen bonding appear to be involved. These processes are not accounted for by organic carbon normalization, suggesting that this data treatment is conceptually inappropriate and fails to describe the sorption behavior. Moreover, prediction of log K-oc based on the hydrophobicity parameter log K-ow is not successful.

Keywords: Acid, Antibiotics, Aquatic Environments, Capillary-Electrophoresis, Carbon, Carboxylic Acid, Cation Exchange, Clay, Complexation, Compounds, Data, Environment, Exchange, Fluoroquinolones, Humic Substances, Hydrogen, Hydrophobic, Literature, Mechanisms, Mobility, Organic Matter, Organic-Matter, Oxytetracycline, Pharmaceuticals, Processes, Review, Soil, Soils, Sorption, Surfaces, Tetracycline, Treatment

Kumar, K.S., Kannan, K., Paramasivan, O.N., Sundaram, V.P.S., Nakanishi, J. and Masunaga, S. (2001), Polychlorinated dibenzo-p-dioxins, dibenzofurans, and polychlorinated biphenyls in human tissues, meat, fish, and wildlife samples from India. *Environmental Science & Technology*, **35** (17), 3448-3455.

Full Text: [E\Env Sci Tec35, 3448.pdf](E/Env%20Sci%20Tec35,%203448.pdf)

Abstract: Concentrations of polychlorinated dibenzo-p-dioxins (PCDDs), dibenzofurans (PCDFs), and non- and mono-orthosubstituted polychlorinated biphenyls (dioxin-like PCBs) were measured in tissues of humans, fishes, chicken, lamb, goat, predatory birds, and Ganges River dolphins collected from various locations in India. PCDDs/DFs were found in most of the samples analyzed with the liver of spotted owlet containing the highest concentration of 3300 pg/g, fat wt. 2,3,7,8-Substituted PCDDs and PCDFs were found in human fat tissues at concentrations ranging from 170 to 1300 pg/g, fat wt. Concentrations of PCDDs were generally greater than those of PCDFs in human tissues, fishes, animal fat, and dolphin. Among fishes, meat, and wildlife samples analyzed, concentrations of PCDDs/DFs were found in the following order: country chicken < goat/lamb fat < fishes < river dolphins < predatory birds. Hepta-CDDs and OCDD were the major PCDD homologues found in humans, fishes, meat products, and dolphins. 2,3,7,8-Tetrachlorodibenzo-p-dioxin equivalents of PCDDs/DFs were greater than those of PCBs in selected fish, dolphin, and human samples. To our knowledge, this is the first report of PCDDs and PCDFs in human tissues, fishes, meat, and wildlife collected from India.

Keywords: Human Adipose-Tissue, Ganges River Dolphins, Tailed Sea Eagles, Organochlorine Pesticides, PCDDs, PCDFs, PCBs, Exposure, Water, Japan

Ghosh, U., Talley, J.W. and Luthy, R.G. (2001), Particle-scale investigation of PAH desorption kinetics and thermodynamics from sediment. *Environmental Science & Technology*, **35** (17), 3468-3475.

Full Text: [E\Env Sci Tec35, 3468.pdf](E/Env%20Sci%20Tec35,%203468.pdf)

Abstract: Dredged sediment from Milwaukee Harbor showed two primary classes of particles in the <2 mm size range: a lighter density coal- and wood-derived fraction with 62% of total PAHs and a heavier-density sand, silt, and clay fraction containing the remaining 38% of the PAHs. Room-temperature PAH desorption kinetic studies on separated sediment fractions revealed slow desorption rates for the coal-derived particles and fast desorption rates for the clay, silt particles. The effect of temperature on PAH release was measured by thermal program desorption mass spectrometry to investigate the desorption activation energies for PAHs on the different sediment particles, Three activated diffusion-based models and an activated first order rate model were used to describe the thermal desorption of PAHs for four molecular weight classes. PAH binding with the coal-derived particles was associated with high activation energies, typically in the range of 115 -139 kJ, mol. PAHs bound to the clay, silt material had much lower activation energy, i.e., in the range of 37-41 kJ, mol for molecular weight 202. Among the desorption models tested, a spherical diffusion model with PAHs located like a rind on the outer 1-3 mum region best described the PAH thermal desorption response for coal-derived particles. This internal PAH distribution pattern on coal-derived particles is based on prior direct measurement of PAH locations at the subparticle scale. These studies reveal that heterogeneous particle types in sediment exhibit much different amounts and binding of PAHs. PAHs associated with coal-derived particles aged over several decades in the field appear to be far from reaching an equilibrium sorption state due to the extremely slow diffusivities through the polymer-like coal matrix. These results provide an improved mechanistic perspective for the understanding of PAH mobility and bioavailability in sediments.

Keywords: Association, Diffusion, Extraction, Kinetics, Lake-Michigan, Long-Term, Model, Organic-Chemicals, Pahs, Polycyclic Aromatic-Hydrocarbons, Release, Sorption Kinetics, Temperature

Williams, A.G.B. and Scherer, M.M. (2001), Kinetics of Cr(VI) reduction by carbonate green rust. *Environmental Science & Technology*, **35** (17), 3488-3494.

Full Text: [E\Env Sci Tec35, 3488.pdf](E/Env%20Sci%20Tec35,%203488.pdf)

Abstract: The kinetics of Cr(VI) reduction to Cr(III) by carbonate green rust were studied for a range of reactant concentrations and pH values. Carbonate green rust, [(Fe4Fe2III)-Fe-IIl(OH)12][4H2O . CO3], was synthesized by induced hydrolysis (i.e., co precipitation) of an Fe(III)/Fe(III) solution held at a constant pH of 8. An average specific surface area of 47±7 m2 g-1 was measured for five separate batches of freeze-dried green rust precipitate. Heterogeneous reduction by Fe(II) associated with the carbonate green rust appears to be the dominant pathway controlling Cr(VI) loss from solution. The apparent stoichiometry of the reaction between ferrous iron associated with green rust ([Fe(II)(GR)]) Cr(VI) was slightly higher than the expected 3: 1 ratio, possibly due to the presence of other oxidants, such as oxygen, protons, or interlayer carbonate ions. The rate of Cr(VI) reduction was proportional to the green rust surface area concentration, and psuedo-first-order rate coefficients (k(obs)) ranging from 1.2×10-3 to 11.2×10-3 s-1 were determined. The effect of pH was small with a 5-fold decrease in rate with increasing pH (from 5.0 to 9.0). At low COO concentrations (< 200 µM), the rate of reaction was first order with respect to Cr(VI) concentration, whereas, at high Cr(VI) concentrations, rates appear to deviate from first-order kinetics and approach a constant value. Estimated amounts of surface Fe(II) and total Fe(II) suggest that the deviation from first-order kinetics observed at higher COO concentrations and the 50-fold decrease in rate observed upon three sequential exposures to Cr(VI) is due to exhaustion of available Fe(II).

Keywords: Zero-Valent Iron, Fe(II)Fe(III) Hydroxy-Carbonate, Layered Double Hydroxides, Chromium(VI) Reduction, Redox Transformations, Natural Environments, Hexavalent Chromium, Chromate Reduction, Ferrous Iron, Oxides

Eljarrat, E., Caixach, J., Rivera, J., De Torres, M. and Ginebreda, A. (2001), Toxic potency assessment of non- and mono-ortho PCBs, PCDDs, PCDFs, and PAHs in northwest Mediterranean sediments (Catalonia, Spain). *Environmental Science & Technology*, **35** (18), 3589-3594.

Full Text: [E\Env Sci Tec35, 3589.pdf](E/Env%20Sci%20Tec35,%203589.pdf)

Abstract: Forty-five marine sediments from the Catalonian coast were analyzed for non-ortho and mono-ortho chlorine substituted PCB congeners, PCDDs and PCDFs, and 16 PAHs. Concentrations of total PCBs ranged from 1.1 to 311 ng/g dry weight (d.w.), and the levels of the sum of the 16 PAHs analyzed ranged between 13.4 ng/g d.w. and 16.7 µg/g d.w. The PCB and PAH contamination was greater near the sites of urban and industrial impact Total toxicity equivalent (TEQ) values were calculated using the toxicity equivalent factors (TEFs) proposed by WHO for dioxin-like PCBs, PCDDs, and PCDFs. These levels ranged between 0.03 and 24.8 pg WHO-TEQ/g d.w. for PCBs and from 0.4 to 39.2 pg WHO-TEQ/g d.w. for PCDDs/PCDFs. Therefore, the suggested sediment quality guideline was sometimes exceeded. Moreover, TEQ values were calculated for PAH concentrations, applying different TEFs proposed by the literature. The results obtained were between 0.3 pg TEQ/g d.w. and 18.4 ng TEQ/g d.w. and showed that the TEQ(PCDD/F) and TEQ(PCB) values were several times lower than the TEQ(PAH) values in the marine sediment samples investigated.

Keywords: Polynuclear Aromatic-Hydrocarbons, Trace Organic Contaminants, Gene-Expression Assays, Dibenzo-p-Dioxins, Polychlorinated-Biphenyls, Environmental-Samples, Masan-Bay, Impact, Korea, Sea

Sakai, S.I., Hayakawa, K., Takatsuki, H. and Kawakami, I. (2001), Dioxin-like PCBs released from waste incineration and their deposition flux. *Environmental Science & Technology*, **35** (18), 3601-3607.

Full Text: [E\Env Sci Tec35, 3601.pdf](E/Env%20Sci%20Tec35,%203601.pdf)

Abstract: To investigate the formation and decomposition behaviors of dioxin-like PCBs during incineration of municipal solid wastes in a recently constructed facility, the concentrations of dioxin-like PCBs were measured in municipal solid waste before incineration and in the incinerator emission gas and residues. Using these values, release inflow ratios of dioxin-like PCB congeners (ratio of the amount released from the incinerator to the amount flowing into the incinerator through waste) were calculated. For PCB congeners 126, 169, and 189, these ratios were greater than 1. In contrast, ratios of the other dioxin-like congeners were much less than 1. To take into account atmospheric sources, the amounts of dioxin-like PCBs released via emissions from municipal solid waste incineration were compared with atmospheric depositions in the Kyoto City area. Most of the PCDD/F congeners and homologue groups were deposited in amounts similar to those found in emissions from the waste incinerator. Deposition of dioxin-like PCB congeners 81, 126, 169, and 189 were also found in amounts similar to those released via the waste incinerator emissions. However, depositions of congeners 105, 114, and 118 greatly exceeded the amounts released via waste incinerator emissions. In reviewing the congener profiles of industrial PCB products and emission gas, the following general trends were observed: (i) For congeners whose contents are high in industrial PCB products (e.g., 105 and 118), the amounts deposited were much higher than the amounts released with waste incineration emission gas. (II) For congeners whose percentages were high in the waste incineration emission gas (e.g., 126 and 189), the amounts deposited were similar to the amounts released in the waste emission gas.

Keywords: Dibenzo-p-Dioxins, Air, PCDD/PCDF, Behavior

Leyva, A.G., Marrero, J., Smichowski, P. and Cicerone, D. (2001), Sorption of antimony onto hydroxyapatite. *Environmental Science & Technology*, **35** (18), 3669-3675.

Full Text: [E\Env Sci Tec35, 3669.pdf](E/Env%20Sci%20Tec35,%203669.pdf)

Abstract: We prepared synthetic hydroxyapatite [HAP, Ca-5(PO4)(3-x)(CO3)(x)(OH)(1+x) (x = 0.3)] and then investigated this material’s ability to remove trivalent antimony [Sb(III)] from water. The HAP was characterized by X-ray diffraction analysis, scanning electron microscopy, X-ray energy dispersive spectroscopy, X-ray photoelectron spectroscopy, and infrared spectroscopy. The sorption of Sb(III)) to HAP was measured over an Sb(III)) concentration range of 0.05-50 mg L-1, at constant ionic strength (l = 0.01 mol dm-3) in equilibrated aqueous suspensions (34 g dm-3) for 5 < pH < 8 in vessels that were closed to the atmosphere. Under-these conditions, we found that HAP particles were enriched in Ca after incongruent dissolution of the solid. More than 95% of the Sb(III)) in solution adsorbed to the solid-phase HAP in < 30 min. The equilibrium distribution of Sb(III) (solid vs liquid phase) was characterized by a Langmuir model with Gamma (max) = 6.7±0.1×10-8 mol m-2 (1.4±0.2×10-4 mol dm-3 g-1) and K-ads = 1.5±0.2×103 dm3 mol-1. As Sb adsorption occurred, the PH of the isoelectric point (pH(iep)) of the HAP suspensions declined from 7.7 to 6.9. This finding supports the idea that the negative surface potential of the HAP increased due to the adsorption of Sb as a charged species. The decline in pHiep during Sb adsorption plus the thermodynamic description of the Sb(III)-HAP-H2O system suggest likely surface reactions for the interaction of Sb with HAP. We discuss the efficiency of Sb removal from water by HAP in the context of phosphate enrichment.

Keywords: Calcium Hydroxyapatite, Immobilization, Mechanism, Phosphate, Apatites, Sorbents, Cadmium, Removal, Surface, FTIR

Stumpf, T., Bauer, A., Coppin, F. and Il Kim, J. (2001), Time-resolved laser fluorescence spectroscopy study of the sorption of Cm(III) onto smectite and kaolinite. *Environmental Science & Technology*, **35** (18), 3691-3694.

Full Text: [E\Env Sci Tec35, 3691.pdf](E/Env%20Sci%20Tec35,%203691.pdf)

Abstract: For long-term performance assessment of nuclear waste repositories knowledge concerning interactions of actinides with mineral surfaces is imperative. The mobility an bioavailability of released radionuclides is strongly dependent on sorption/desorption processes onto mineral surfaces. Therefore it is necessary to characterize the surface species formed and to elucidate the reaction mechanisms involved. The high fluorescence spectroscopic sensitivity of Cm(III) has attracted our interest regarding the complexation process of Cm(III) onto smectite and kaolinite as a model system for the sorption of trivalent actinides in the trace concentration range. We conclude that at low pH Cm(III) is sorbed onto kaolinite and smectite as an outer-sphere complex and retains its complete primary hydration sphere. With increasing pH inner-sphere adsorption onto kaolinite and smectite occurs via the aluminol edge sites. The same evolution of the Cm(III)-clay surface species as a function of pH was observed for both minerals. Starting at a pH greater than or equal to 5 we observe the formation of a equivalent to Al-O-Cm2+- (H2O)5 surface complex, which is replaced by a second species at higher pH. The second surface complex may be a monodentate equivalent to Al-O-Cm+(OH)(H2O)4 species or bidentate equivalent to (Al-O)(2)-Cm+(H2O)5 species. The Cm(III)/clay surface complexes are characterized by their emission spectra (peak maxima at 598.8 and 603.3 nm) and their fluorescence lifetime (both 110±7 mus). An important result in view of the mobility and bioavailability of radionuclides is that no incorporation of Cm(III) into the bulk clay structure was observed.

Keywords: Concentrated Electrolyte-Solutions, Trivalent Actinides, Complexes, Montmorillonite, Thermodynamics, Curium(III)

Schneegurt, M.A., Jain, J.C., Menicucci, J.A., Brown, S.A., Kemner, K.M., Garofalo, D.F., Quallick, M.R., Neal, C.R. and Kulpa, C.F. (2001), Biomass byproducts for the remediation of wastewaters contaminated with toxic metals. *Environmental Science & Technology*, **35** (18), 3786-3791.

Full Text: [E\Env Sci Tec35, 3786.pdf](E/Env%20Sci%20Tec35,%203786.pdf)

Abstract: Pollution of the environment with toxic metals is widespread and often involves large volumes of wastewater. Remediation strategies must be designed to support high throughput while keeping costs to a minimum. Biosorption is presented as an alternative to traditional physicochemical means for removing toxic metals from wastewater. We have investigated the metal binding qualities of two biomass byproducts that are commercially available in quantity and at low cost, namely “spillage”, a dried yeast and plant mixture from the production of ethanol from corn, and ground corn cobs used in animal feeds. The biomass materials effectively removed toxic metals, such as Cu, Cs, Mo, Ni, Pb, and Zn, even in the presence of competing metals likely to be found in sulfide mine tailing ponds. The effectiveness of these biosorbents was demonstrated using samples from the Berkeley Pit in Montana. Investigations included column chromatography and slurry systems, and linear distribution coefficients are presented. X-ray spectroscopy was used to identify the binding sites for metals adsorbed to the spillage material. The results of our experiments demonstrate that the biosorption of metals from wastewaters using biomass byproducts is a viable and cost-effective technology that should be included in process evaluations.

Keywords: Heavy-Metals, Aqueous-Solutions, *Saccharomyces-Cerevisiae*, *Aspergillus-Niger*, Removal, Biosorption, Recovery, Binding, Products, Cadmium

Schneider, A.R., Stapleton, H.M., Cornwell, J. and Baker, J.E. (2001), Recent declines in PAH, PCB, and toxaphene levels in the northern Great Lakes as determined from high resolution sediment cores. *Environmental Science & Technology*, **35** (19), 3809-3815.

Full Text: [E\Env Sci Tec35, 3809.pdf](E/Env%20Sci%20Tec35,%203809.pdf)

Abstract: Sediment cores were collected from two sites in Grand Traverse Bay, Lake Michigan in May 1998, dated using Pb-210 geochronology, and analyzed for polychlorinated biphenyl (PCB) congeners, polycyclic aromatic hydrocarbons (PAHs), and toxaphene. The extraordinarily high sediment focusing and accumulation rates in these cores relative to other Great Lakes sediments allowed quantification of high-resolution temporal trends in the burial of hydrophobic organic contaminants. The focus-corrected accumulation rate of total PCBs (sum of 105 congeners) in 1998 was 0.50 ng/cm2year at both sites. Toxaphene and total PAH (t-PAH, sum of 33 compounds) surficial accumulations varied at each site and ranged from 0.08 to 0.41 ng/cm2 year for toxaphene and 25 to 52 ng/cm2-yr for t-PAHs at the two sites. The maximum t-PAH accumulation rate was in sediment dated from 1942, and PAH accumulation decreased from 1942 to 1980 with a first-order rate of decline 0.017 yr-1. Both toxaphene and t-PCB accumulations peaked in sediment deposited in 1972, after which their accumulations decreased with nearly identical rates of decline (0.027 yr-1 and 0.028 yr-1, respectively).

Keywords: Polycyclic Aromatic-Hydrocarbons, Hudson River Sediments, Polychlorinated-Biphenyls, Spatial Trends, Michigan, Biodegradation, Inventories, Superior, Organochlorines, Accumulation

Villalobos, M., Trotz, M.A. and Leckie, J.O. (2001), Surface complexation modeling of carbonate effects on the adsorption of Cr(VI), Pb(II), and U(VI) on goethite. *Environmental Science & Technology*, **35** (19), 3849-3856.

Full Text: [E\Env Sci Tec35, 3849.pdf](E/Env%20Sci%20Tec35,%203849.pdf)

Abstract: Dissolved carbonate species are known to affect the sorption behavior of trace species. The macroscopic description of these interactions with a thermodynamic approach has been limited by the lack of data on the binary interaction between carbonate and relevant mineral surfaces. This work follows from two detailed studies of carbonate adsorption on goethite (4, 13). It shows that independent triple-layer surface complexation modeling (TLM) of carbonate adsorption allows successful descriptions of carbonate-trace element ternary sorption on this oxide, using relatively simple and optimal stoichiometries. Carbonate adsorption was considerably enhanced in the presence of Pb(II), despite an invariant total Pb(II) sorption to equilibration with UP to 1% CO2(g). Both the Pb(II)carbonate system behavior and the anion-like PH adsorption behavior of U(VI) in the presence of CO2 were successfully modeled using binary and ternary metal-bound surface complexes. The significant reduction of Cr(VI) adsorption edges to lower PH values in the presence of CO2 was accurately simulated and explained via site competition and surface electrostatic repulsion effects on the predicted inner- and outer-sphere Cr(VI) surface complexes formed. The results of this research are highly relevant to modeling of metal transport field data and of potential soil remediation schemes using carbonate.

Keywords: Oxide-Solution Interfaces, Alpha-Feooh, Contaminated Soils, Titration Data, Parameters, Transport, Ions, Groundwater, Sorption, Chromium

Hell, K., Stieglitz, L. and Dinjus, E. (2001), Mechanistic aspects of the de-novo synthesis of PCDD/PCDF on model mixtures and MSWI fly ashes using amorphous 12C- and 13C-labeled carbon. *Environmental Science & Technology*, **35** (19), 3892-3898.

Full Text: [E\Env Sci Tec35, 3892.pdf](E/Env%20Sci%20Tec35,%203892.pdf)

Abstract: The formation of polychlorinated dibenzo-p-dioxins (PCDD) and dibenzofurans (PCDF) from amorphous 12C- and 13C-labeled carbon was studied on model mixtures and real fly ashes. PCDD/F can either be formed directly (de-novo) from carbon already present in fly ash or step-by-step via condensation of two aromatic rings. Using model mixtures containing 12C- and 13C-labeled carbon in various ratios we observed the formation of the following compound classes: 12C6-PCPh, -PCBz, 13C6-PCPh, -PCBz, 12C12-PCDD/F, 13C12-PCDD/F, and 12C6 -13C6 -PCDD/F. By examining the fraction of the mixed PCDD/F (one of the two aromatic ring is composed solely of 12C -atoms while the other contains only 13C-atoms) in the total concentration of PCDD/F, conclusions on the formation of these three ring structures are possible. From the experimental results, it can be concluded that both reaction mechanisms are operative in the formation of PCDD/F from carbon. On fly ashes approximately half of the total amount of PCDD is formed via condensation of de-novo created C6-precursors e.g. chlorophenols, while the remainder is directly released (denovo) from the carbon i.e., formed from a related 12C-structure. However, the condensation of intermediate aromatic C6-precursors is of minor importance in the formation of PCDF. With increasing temperature the relative amount of the 12C613C6-PCDD formed by condensation decreases due to the faster evaporation of chlorophenols. At a constant reaction temperature, the ratio of both reaction pathways is hardly influenced by reaction time. In experiments with fly ashes doped with 13C-labeled carbon, this carbon isotope shows a similar reactivity as the native carbon present on the fly ash. Thus, the used amorphous carbons are suitable models for this investigation.

Keywords: Dibenzo-p-Dioxins, Conversion

Melitas, N., Chuffe-Moscoso, O. and Farrell, J. (2001), Kinetics of soluble chromium removal from contaminated water by zerovalent iron media: Corrosion inhibition and passive oxide effects. *Environmental Science & Technology*, **35** (19), 3948-3953.

Full Text: [E\Env Sci Tec35, 3948.pdf](E/Env%20Sci%20Tec35,%203948.pdf)

Abstract: Permeable reactive barriers containing zerovalent iron are being increasingly employed for in situ remediation of groundwater contaminated with redox active metals and chlorinated organic compounds. This research investigated the effect of chromate concentration on its removal from solution by zerovalent iron. Removal rates of aqueous Cr(VI) by iron wires were measured in batch experiments for initial chromium concentrations ranging from 100 to 10 000 µg/L. Chromate removal was also measured in columns packed with zerovalent iron filings over this same concentration range. Electrochemical measurements were made to determine the free corrosion potential and corrosion rate of the iron reactants. In both the batch and column reactors, absolute rates of chromium removal declined with increasing chromate concentration. Corrosion current measurements indicated that the rate of iron corrosion decreased with increasing Cr(VI) concentrations between 0 and 5000 µg/L. At a Cr(VI) concentration of 10 000 µg/L, Tafel polarization diagrams showed that chromium removal was affected by its diffusion rate through a passivating oxide film and by the ability of iron to release Fe2+ at anodic sites. In contrast, water reduction was not mass transfer limited, but chromium did decrease the exchange current for the hydrogen evolution reaction. Even at the most passivating concentration of 10 000 µg/L, effluent Cr(VI) concentrations in the column reactors reached a steady state, indicating that passivation had also reached a steady state. Although chromate contributes to iron surface passivation, the removal rates are still sufficiently fast for in situ iron barriers to be effective for Cr(VI) removal at most environmentally relevant concentrations.

Keywords: Zero-Valent Iron, Hydrogen Evolution Reaction, Hexavalent Chromium, Reduction, Chromate, Hydroxide, Barrier, Groundwater, Remediation

Lin, Y.H., Fryxell, G.E., Wu, H. and Engelhard, M. (2001), Selective sorption of cesium using self-assembled monolayers on mesoporous supports. *Environmental Science & Technology*, **35** (19), 3962-3966.

Full Text: [E\Env Sci Tec35, 3962.pdf](E/Env%20Sci%20Tec35,%203962.pdf)

Abstract: The synthesis of a novel nanocomposite sorbent material, copper ferrocyanide immobilized within a mesoporous ceramic matrix, and its use as a novel cesium sorbent material is reported in this paper. Complete removal of cesium was achieved in the presence of competing metal ions for solutions containing 2 ppm cesium under a variety conditions. Loading capacity of more than 1.35 mmol Cs per g of sorbent material has been achieved. The exceptionally fast binding kinetics and high loading capacity, resulting from the rigidly open pore structure and extremely high surface area of the sorbent materials, make them potentially very useful for the removal of cesium from nuclear wastes and contaminated groundwater.

Keywords: Copper Ferrocyanide, Functionalized Monolayers, Hexacyanoferrate(II), Strontium, Removal

Tettamanti, M., Lasagni, M., Collina, E., Sancassani, M., Pitea, D., Fermo, P. and Cariati, F. (2001), Thermal oxidation kinetics and mechanism of sludge from a wastewater treatment plant. *Environmental Science & Technology*, **35** (19), 3981-3987.

Full Text: [E\Env Sci Tec35, 3981.pdf](E/Env%20Sci%20Tec35,%203981.pdf)

Abstract: The organic fraction of a sludge from a wastewater biological treatment plant is characterized by the total organic carbon, TOC, content, cyclohexane and toluene extractions, and thermal desorptions in nitrogen and air flow at different temperatures. The inorganic fraction is characterized by water extraction, FT-IR spectroscopy, thermogravimetric analysis, and scanning electron microscopy/energy dispersion X-ray analysis. The thermal degradation rate of organic carbon is studied in batch experiments in air, in the 250-500 degreesC temperature range. The sample TOC is used to measure the decrease of reagent concentration with time. The TOC vs time data are well fitted by a generalized kinetic model, previously proposed for the MSWIs fly ash thermal degradation. The rate constants of the immediate carbon gasification, k(2), and of the dissociative oxygen chemisorption, k(1), followed by C(O) intermediate gasification, k(3), together with activation and thermodynamic parameters are calculated. The rate determining step is the C(O) oxidation. The influence of desorbed or extracted organic compounds on kinetics and the role of the C(O) formation in explaining the reaction mechanism as well as the comparison with fly ash kinetics are discussed.

Keywords: Native Carbon Gasification, Incinerator Fly-Ash, Dibenzo-p-Dioxins, Combustion, Degradation, Temperature, Benzenes

Lohmann, R., Ockenden, W.A., Shears, J. and Jones, K.C. (2001), Atmospheric distribution of polychlorinated dibenzo-p-dioxins, dibenzofurans (PCDD/Fs), and non-ortho biphenyls (PCBs) along a North-South Atlantic transect. *Environmental Science & Technology*, **35** (20), 4046-4053.

Full Text: [E\Env Sci Tec35, 4046.pdf](E/Env%20Sci%20Tec35,%204046.pdf)

Abstract: Air samples were taken on board the RRS Bransfield (typically for 24-72 h), during an Atlantic cruise from the U.K. to Antarctica in October-December 1998, to investigate the global scale distribution of PCDD/Fs and coplanar PCBs. Highest concentrations of Cl2-8DD/Fs all occurred between 25 and 52 degreesN, lowest concentrations were measured around similar to 60 degreesS and further south. Cl3DFs showed highest overall concentrations (up to 9800 fg/m3), followed by Cl2DFs (up to 5300 fg/m3) and OCDD (up to 1300 fg/m3). Lowest concentrations, measured in the remote Southern hemisphere, were generally 2 orders of magnitude lower than their highest concentrations over the North Atlantic. Concentrations of PCB-77 were higher in the northern hemisphere, while PCB-126 and PCB-169 exhibited highest concentrations around the equator. Evidence was obtained for substantial emissions of PCDD/Fs off west Africa and while in the port of Montevideo, Uruguay. Shifts in PCDD/F profile distribution were observed on increasing distance from source regions, such that those from the most remote locations were dominated by Cl3DF (similar to 40% of the total) and OCDD (similar to 20%). Gas-particle partition data was obtained for all samples. Cl4-6DD/Fs showed the widest range, varying between 10 and 90% of the total in the gas phase, depending on location/temperature. The study gave limited evidence for the influence of OH-radical initiated depletion reactions of gaseous PCDD/Fs. The global atmospheric burden is estimated to be on the order of 350 kg Sigma Cl4-8DD/Fs and similar to3 kg Sigma TEQ.

Keywords: Persistent Organic Pollutants, Long-Range Transport, Air-Water Exchange, Mass-Balance, Environment, Sediments, Fluxes

? Huttenloch, P., Roehl, K.E. and Czurda, K. (2001), Sorption of nonpolar aromatic contaminants by chlorosilane surface modified natural minerals. *Environmental Science & Technology*, **35** (21), 4260-4264.

Full Text: [2001\Env Sci Tec35, 4260.pdf](2001/Env%20Sci%20Tec35,%204260.pdf)

Abstract: The efficacy of the surface modification of natural diatomite and zeolite material by chlorosilanes is demonstrated. Chlorosilanes used were trimethylchlorosilane (TMSCI), tert-butyldimethylchlorosilane (TBDMSCI), dimethyloctadecylchlorosilane (DMODSCI), and diphenyldichlorosilane (DPDSCI) possessing different headgroups and chemical properties. Silanol groups of the diatomite and zeolite were modified by chemical reaction with the chlorosilanes resulting in a stable covalent attachment of the organosilanes to the mineral surface. The alteration of surface properties of the modified material was proved by measurements of water adsorption capacity, total organic carbon (TOC) content, and thermoanalytical data. The surface modified material showed great stability even when exposed to extremes in ionic strength, pH, and to pure organic solvents, Sorption of toluene, o-xylene, and naphthalene from water was greatly enhanced by the surface modification compared to the untreated materials which showed no measurable sorption of these compounds. The enhanced sorption was dependent on the organic carbon content as well as on chemical characteristics of the chlorosilanes used. Batch sorption experiments showed that the phenyl headgroups of DPDSCI have the best affinity for aromatic compounds. Removal from an aqueous solution of 10 mg/L of naphthalene, o-xylene, and toluene was 71%, 60%, and 30% for surface modified diatomite and 51%,30%, and 16% for modified clinoptilolite, respectively. Sorption data were well described by the Freundlich isotherm equation, which indicated physical adsorption onto the lipophilic surface rather than partitioning into the surface organic phase. The chlorosilane modified materials have an apparent potential for application in environmental technologies such as permeable reactive barriers (PRB) or wastewater treatment.

Keywords: Adsorption, Aromatic, Attachment, Barriers, Capacity, Carbon, Carbon Content, Chemical, Chemical Properties, Contaminants, Covalent Attachment, Diatomite, Environmental, Equilibria, Freundlich Isotherm, Hydrocarbons, Ionic Organic-Compounds, Ionic Strength, Isotherm, Materials, Matter, Measurements, Mineral, Modification, Modified Zeolite, Natural, Organic, Organic Carbon, Partitioning, pH, Physical Adsorption, Properties, Reaction, Removal, Soil, Sorption, Stability, Surface Modification, Surface Properties, Toc, Toluene, Total Organic Carbon, Treatment, Wastewater, Wastewater Treatment, Water, Water Adsorption, Zeolite

Klimmek, S., Stan, H.J., Wilke, A., Bunke, G. and Buchholz, R. (2001), Comparative analysis of the biosorption of cadmium, lead, nickel, and zinc by algae. *Environmental Science & Technology*, **35** (21), 4283-4288.

Full Text: [E\Env Sci Tec35, 4283.pdf](E/Env%20Sci%20Tec35,%204283.pdf)

Abstract: Thirty strains of algae were examined for their biosorption abilities in the uptake of cadmium, lead, nickel, and zinc from aqueous solution. A wide range of adsorption capacities between the different strains of algae and between the four metals can be observed. The cyanophyceae *Lyngbya taylorii* exhibited high uptake capacities for the four metals. The algae showed maximum capacities according to the Langmuir Adsorption Model of 1.47 mmol lead, 0.37 mmol cadmium, 0.65 mmol nickel, and 0.49 mmol zinc per gram of dry biomass. The optimum pH for *L. taylorii* was between pH 3 and 7 for lead, cadmium, and zinc and between pH 4 and 7 for nickel. Studies with the algae indicated a preference for the uptake of lead over cadmium, nickel, and zinc in a four metal solution. The metal binding abilities of *L. taylorii* could be improved by phosphorylation of the biomass. The modified biosorbent demonstrated maximum capacities of 2.52 mmol cadmium, 3.08 mmol lead, 2.79 mmol nickel, and 2.60 mmol zinc per gram of dry biomass. Investigations with phosphated *L. taylorii* indicated high capacities for the four metals also at low pH. The selectivity remained quite similar to the unmodified algae.

Keywords: Heavy-Metal Biosorption, Axenic Mass-Culture, Chemical Modification, Nonliving Biomass, Aqueous-Solutions, Datura-Innoxia, Marine-Algae, Removal, Adsorption, Microalgae

Notes: highly cited

Yun, Y.S., Park, D., Park, J.M. and Volesky, B. (2001), Biosorption of trivalent chromium on the brown seaweed biomass. *Environmental Science & Technology*, **35** (21), 4353-4358.

Full Text: [E\Env Sci Tec35, 4353.pdf](E/Env%20Sci%20Tec35,%204353.pdf)

Abstract: Biosorption has attracted attention as a cost-effective means for the treatment of metal-bearing wastewater. However, the mechanism of metal binding is not clearly understood, and consequently, modeling of the biosorption performance is still raising debates. In this study, the biosorption of trivalent chromium was investigated with protonated brown alga Ecklonia biomass as a model system. Titration of the biomass revealed that it contains at least three types of functional groups. The Fourier transform infrared spectrometry showed that the carboxyl group was the chromium-binding site within the pH range (pH 1-5) used in this study, where chromium does not precipitate. The pKvalue and the number of carboxyl groups were estimated to be 4.6±0.1 and 2.2±0.1 mmol/g, respectively. The equilibrium sorption isotherms determined at different solution pH indicated that the uptake of chromium increased significantly with increasing pH, A model for the description of chromium biosorption was developed incorporating the hydrolysis reactions that chromium undergoes in the aquatic phase. The model was able to predict the equilibrium sorption experimental data at different pH values and chromium concentrations. In addition, the speciation of the binding site as a function of the solution pH was predicted using the model in order to visualize the distribution of chromium ionic species on the binding site.

Keywords: Heavy-Metal Biosorption, Ion-Exchange, Removal, Biosorbent, Protons, Waste

Beleza, V.M., Boaventura, R.A. and Almeida, M.F. (2001), Kinetics of chromium removal from spent tanning liquors using acetylene production sludge. *Environmental Science & Technology*, **35** (21), 4379-4383.

Full Text: [E\Env Sci Tec35, 4379.pdf](E/Env%20Sci%20Tec35,%204379.pdf)

Abstract: The removal of Cr(III) present in spent leather tanning baths by precipitation with acetylene production sludge (APS) is studied. The hydroxide and carbonate contents in APS were 1.05 and 0.10 g of CaCO3/g of dry sludge, respectively, and the Cr concentration in the tanning bath was 2467 mg/L. The experimental work was carried out at 15, 20, 25, 30, and 35 degreesC using APS samples of different grain size (89, 178, and 356 μm). Percent removals after 180-min reaction time using 356 μm APS particles range from 99.0 to 99.9 as temperature increased from 15 to 35 degreesC. Similar or higher removal rates are obtained when using smaller APS particles. Chromium removal efficiencies using APS as precipitant are comparable with those obtained with NaOH, CaO, or MgO. The Cr conversion X increases with time t and is related to the particle radius and the absolute temperature T by the expression X/1 - X = r(0)(-0.22) exp((45.45-13401/T))t. The average activation energy for the reaction is 111.4 kJ mol-1. Despite some deviations observed for the finer particles and the lower temperature (15 degreesC), the model describes adequately the results obtained for all APS particle sizes at 20 degreesC.

? Hoskins, J.S. and Karanfil, T. (2002), Removal and sequestration of iodide using silver-impregnated activated carbon. *Environmental Science & Technology*, **36** (4), 784-789.

Full Text: [2002\Env Sci Tec36, 784.pdf](2002/Env%20Sci%20Tec36,%20784.pdf)

Abstract: Two silver-impregnated activated carbons (SIACs) (0.05 and 1.05 wt % silver) and their virgin (i.e., unimpregnated) granular activated carbon (GAC) precursors were investigated for their ability to remove and sequester iodide from aqueous solutions in a series of batch sorption and leaching experiments. Silver content, total iodide concentration, and pH were the factors controlling the removal mechanisms of iodide. Iodide uptake increased with decreasing pH for both SIMS and their virgin GACs. The 0.05% SIAC behaved similarly to its virgin GAC in all experimental conditions because of its low silver content. At pH values of 7 and 8 there was a marked increased in iodide removal for the 1.05% SIAC over that of its virgin GAC, while their performances were similar at a pH of 5. Scanning electron microscopy (SEM) and energy-dispersive X-ray (EDX) analyses prior to reaction with iodide showed the presence of metallic silver agglomerates on the 1.05% SIAC surface. After the reaction, elemental mapping with EDX showed the formation of silver iodide agglomerates. Oxidation of metallic silver was observed in the presence of oxygen, and the carbon surface appears to catalyze this reaction. When the molar ratio of silver to iodide was greater than 1 (i.e., M-Ag,M-SIAC > M-I,M-TOTAL), precipitation of silver iodide was the dominant removal mechanism. However, unreacted silver leached into solution with decreasing pH while iodide leaching did not occur. When MAg,SIAC M-I,M-TOTAL, silver iodide precipitation occurred until all available silver had reacted, and additional iodide was removed from solution by pH-dependent adsorption to the GAC. Under this condition, silver leaching did not occur while iodide leaching increased with increasing pH.

Keywords: Activated Carbon, Adsorption, Carbon, Concentration, Condition, EDX, Electron Microscopy, GAC, Granular Activated Carbon, Leaching, Low, Mapping, Mechanism, Mechanisms, Microscopy, Oxygen, pH, pH Values, Precipitation, Precursors, Reaction, Removal, Removal Mechanism, SEM, Sequestration, Silver, Sims, Sorption, Surface, Uptake

? Pettine, M., Campanella, L. and Millero, F.J. (2002), Reduction of hexavalent chromium by H2O2 in acidic solutions. *Environmental Science & Technology*, **36** (5), 901-907.

Full Text: [2002\Env Sci Tec36, 901.pdf](2002/Env%20Sci%20Tec36,%20901.pdf)

Abstract: The rates of the reduction of Cr(VI) with H2O2 were measured in NaCl solutions as a function of pH (1.5-4.8), temperature (5-40°C), and ionic strength (I = 0.01-2 M) in the presence of an excess of reductant. The rate of Cr(VI) reduction is described by the general expression -d[Cr(VI)]/dt = k(2)[Cr(VI)](m)[H2O2](n)[H+](z), where m = I and n and z are two interdependent variables. The value of n is a function of pH between 2 and 4 (n = (3 x 10(a))/(1 + 10(a)), where a = -0.25 - 0.58pH + 0.26pH(2)) leveling off at pH < 2 (where n approximate to 1) and pH > 4 (where n approximate to 3). The rates of Cr(VI) reduction are acid-catalyzed, and the kinetic order z varies from about 1.8-0.5 with increasing H2O2 concentration, according to the equation z = 1.85 - 350.1 H2O2 (M) which is valid for [H2O2] < 0.004 M. The values of k(2) (M-(n+z) min-1) are given by k(2) = k/[H+](z) = k(1)/[H2O2](n)[H+](z), where k is the overall rate constant (M-n min-1) and k(1) is the pseudo-first-order rate constant (min-1). The values of k in the pH range 2-4 have been fitted to the equation log k = 2.14pH - 2.81 with sigma = +/-0.18. The values of k(2) are dependent on pH as well. Most of the results with H2O2 < 3 mM are described by log k(2) = 2.87pH - 0.55 with sigma = +/- 0.54. Experimental results suggest that the reduction of Cr(VI) to Cr(Ill) is controlled by the formation of Cr(V) intermediates. Values of k(2) and k calculated from the above equations can be used to evaluate the rates of the reaction in acidic solutions under a wide range of experimental conditions, because the rates are independent of ionic strength, temperature, major ions, and micromolar levels of trace metals (Cu2+, Ni2+, Pb2+). The application of this rate law to environmental conditions suggests that this reaction may have a role in acidic solutions (aerosols and fog droplets) in the presence of high micromolar concentrations of H2O2.

Keywords: Hydrogen-Peroxide, Aqueous-Solutions, Kinetics, Media, Decomposition, Complexes, Sulfide, Metals, Ion, VI

Manning, B.A., Fendorf, S.E., Bostick, B. and Suarez, D.L. (2002), Arsenic(III) oxidation and arsenic(V) adsorption reactions on synthetic birnessite. *Environmental Science & Technology*, **36** (5), 976-981.

Full Text: [E\Env Sci Tec36, 976.pdf](E/Env%20Sci%20Tec36,%20976.pdf)

Abstract: The oxidation of arsenite (As(III) by manganese oxide is an important reaction in both the natural cycling of As and the development of remediation technology for lowering the concentration of dissolved As(III) in drinking water. This study used both a conventional stirred reaction apparatus and extended X-ray absorption fine structure (EXAFS) spectroscopy to investigate the reactions of As(III) and As(V) with synthetic birnessite (MnO2). Stirred reactor experiments indicate that As(III) is oxidized by MnO2 followed by the adsorption of the As(V) reaction product on the MnO2 solid phase. The As(V)-Mn interatomic distance determined by EXAFS analysis for both As(III)- and As(V)treated MnO2 was 3.22Angstrom, giving evidence for the formation of As(V) adsorption complexes on MnO2 crystallite surfaces. The most likely As(V)-MnO2 complex is a bidentate binuclear corner sharing (bridged) complex occurring at MnO2 crystallite edges and interlayer domains. In the As(III)treated MnO2 systems, reductive dissolution of the MnO2 solid during the oxidation of As(III) caused an increase in the adsorption of As(V) when compared with As(V)-treated MnO2. This suggested that As(III) oxidation caused a surface alteration, creating fresh reaction sites for As(V) on MnO2 surfaces.

Keywords: Performance Liquid-Chromatography, Atomic-Absorption Spectrometry, Na-Rich Birnessite, Hexagonal Birnessite, Manganese, Spectroscopy, Groundwater, Speciation, As(III), Soils

Notes: highly cited

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Full Text: [2002\Env Sci Tec36, 1202.pdf](2002/Env%20Sci%20Tec36,%201202.pdf)

Abstract: To provide the first nationwide reconnaissance of the occurrence of pharmaceuticals, hormones, and other organic wastewater contaminants (OWCs) in water resources, the U.S. Geological Survey used five newly developed analytical methods to measure concentrations of 95 OWCs in water samples from a network of 139 streams across 30 states during 1999 and 2000. The selection of sampling sites was biased toward streams susceptible to contamination (i.e. downstream of intense urbanization and livestock production). OWCs were prevalent during this study, being found in 80% of the streams sampled. The compounds detected represent a wide range of residential, industrial, and agricultural origins and uses with 82 of the 95 OWCs being found during this study. The most frequently detected compounds were coprostanol (fecal steroid), cholesterol (plant and animal steroid), N,N-diethyltoluamide (insect repellant), caffeine (stimulant), triclosan (antimicrobial disinfectant), tri(2-chloroethyl)phosphate (fire retardant), and 4-nonylphenol (nonionic detergent metabolite). Measured concentrations for this study were generally low and rarely exceeded drinking-water guidelines, drinking-water health advisories, or aquatic-life criteria. Many compounds, however, do not have such guidelines established. The detection of multiple OWCs was common for this study, with a median of seven and as many as 38 OWCs being found in a given water sample. Little is known about the potential interactive effects (such as synergistic or antagonistic toxicity) that may occur from complex mixtures of OWCs in the environment. In addition, results of this study demonstrate the importance of obtaining data on metabolites to fully understand not only the fate and transport of OWCs in the hydrologic system but also their ultimate overall effect on human health and the environment.

Keywords Plus: In-Ground Water, Surface Waters, Drug Residues, Antibiotics, Environment, Pesticides, Sewage, Fish, Ciprofloxacin, Spectrometry

? Ebinghaus, R., Kock, H.H., Temme, C., Einax, J.W., Lowe, A.G., Richter, A., Burrows, J.P. and Schroeder, W.H. (2002), Antarctic springtime depletion of atmospheric mercury. *Environmental Science & Technology*, **36** (6), 1238-1244.

Full Text: [2002\Env Sci Tec36, 1238.pdf](2002/Env%20Sci%20Tec36,%201238.pdf)

Abstract: Unlike other heavy metals that are inherently associated with atmospheric aerosols, mercury in ambient air exists predominantly in the gaseous elemental form. Because of its prolonged atmospheric residence time, elemental mercury vapor is distributed on a global scale. Recently, Canadian researchers have discovered that total gaseous mercury levels in the lower tropospheric boundary layer in the Canadian Arctic are often significantly depleted during the months after polar sunrise. A possible explanation may involve oxidation of elemental mercury, followed by adsorption and deposition of the oxidized form, leading to an increased input of atmospheric mercury into the Arctic ecosystem. Here we present the first continuous high-time-resolution measurements of total gaseous mercury in the Antarctic covering a 12-month period between January 2000 and January 2001 at the German Antarctic research station Neumayer (70degrees39’ S, 8degrees15’ W). We report that mercury depletion events also occur in the Antarctic after polar sunrise and Compare our measurements with a data set from Alert, Nunavut, Canada. We also present indications that BrO radicals and ozone play a key role in the boundary-layer chemistry during springtime mercury depletion events in the Antarctic troposphere.

Keywords: Bromine-Monoxide, Ozone Depletion, Speciation, Trends, Budget, Ocean, GOME, BRO

Notes: highly cited

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Full Text: [2002\Env Sci Tec36, 1757.pdf](2002/Env%20Sci%20Tec36,%201757.pdf)

Abstract: The mechanisms whereby As(III) and As(V) in aqueous solution (pH 5.5-6.5) interact with the surfaces of goethite, lepidocrocite, mackinawite, and pyrite have been investigated using As K-edge EXAFS and XANES spectroscopy. Arsenic species retain original oxidation states and occupy similar environments on the oxyhydroxide substrates, with first-shell coordination to four oxygens at 1.78 Angstrom for As(III) and 1.69 Angstrom for As(V). In agreement with other workers, we find that inner sphere complexes form, apparently involving bidentate (bridging) arsenate or arsenite. Interaction of As(III) and As(V) with the sulfide surfaces shows primary coordination to four oxygens (As-0: 1.69-1.76 Angstrom) with further sulfur (similar to3.1 Angstrom) and iron (3.4-3.5Angstrom) shells suggesting outer sphere complexation. Arsenic species were also coprecipitated with mackinawite (pH 4.0), and these samples were further studied following oxidation. At high As(III) or As(V) concentrations, arsenate or arsenite species form, probably as sorption complexes, along with poorly crystalline arsenic sulfide (the only product at low As(V) concentrations). All oxidized samples show primary coordination to four oxygens at 1.7 Angstrom, indicating As(V); these arsenates may show both outer sphere complexation with residual mackinawite and inner sphere complexation with new oxyhydroxides. These experiments help to clarify our understanding of As mobility in near-surface environments.

Keywords: Adsorption, Chromate Retention Mechanisms, Complexes, Coprecipitation, Curved-Wave Theory, Exafs, Ferrihydrite, Interaction, Kinetics, Refinement, Sorption, Surface-Chemistry

Notes: highly cited

Reddad, Z., Gérente, C., Andres, Y. and Le Cloirec, P. (2002), Adsorption of several metal ions onto a low-cost biosorbent: Kinetic and equilibrium studies. *Environmental Science & Technology*, **36** (9), 2067-2073.

Full Text: [E\Env Sci Tec36, 2067.pdf](E/Env%20Sci%20Tec36,%202067.pdf)

Abstract: Sugar beet pulp generated by sugar-refining factories has been shown to be an effective adsorbent for the removal of heavy metals from aqueous solutions. The structural components related to the metallic adsorption being determined, batch adsorption studies were performed for several metal ions, namely, Pb2+, Cu2+, Zn2+, Cd2+, and Ni2+ cations. Two simple kinetic models, that is, pseudo-first- and pseudo-second-order, were tested to investigate the adsorption mechanisms. The kinetic parameters of the models were calculated and discussed. For an 8×10-4 M initial metal concentration, the initial sorption rates (*v*0) ranged from 0.063 mmol.g-1.min-1 for Pb2+ to 0.275 mmol.g-1.min-1 for Ni2+ ions, in the order Ni2+ > Cd2+ > Zn2+ > Cu2+ > Pb2+. The equilibrium data fitted well with the Langmuir and Freundlich models and showed the following affinity order of the material: Pb2+ > Cu2+ > Zn2+ > Cd2+ > Ni2+. The metal removal was strongly dependent on pH and, to a lesser extent, ionic strength. Ion exchange with Ca2+ ions neutralizing the carboxyl groups of the polysaccharide was found to be the predominant mechanism, added with complexation for Pb2+, Cu2+, and Zn2+ metals.

Keywords: Activated Carbon, Adsorption, Aqueous-Solution, Binding, Biosorption, Citric-Acid, Equilibrium, Heavy-Metals, Hull, Metal, Polysaccharide Complexes, Removal, Sorption

Melitas, N., Wang, J., Conklin, M., O’Day, P. and Farrell, J. (2002), Understanding soluble arsenate removal kinetics by zerovalent iron media. *Environmental Science & Technology*, **36** (9), 2074-2081.

Full Text: [E\Env Sci Tec36, 2074.pdf](E/Env%20Sci%20Tec36,%202074.pdf)

Abstract: Zerovalent iron filings have been proposed as a filter medium for removing arsenic compounds from potable water supplies. This research investigated the kinetics of arsenate removal from aqueous solutions by zerovalent iron media. Batch experiments were performed to determine the effect of the iron corrosion rate on the rate of As(V) removal. Tafel analyses were used to determine the effect of the As(V) concentration on the rate of iron corrosion in anaerobic solutions. As(V) removal in column reactors packed with iron filings was measured over a 1-year period of continuous operation. Comparison of As(V) removal by freely corroding and cathodically protected iron showed that rates of arsenate removal were dependent on the continuous generation of iron oxide adsorption sites. In addition to adsorption site availability, rates of arsenate removal were also limited by mass transfer associated with As(V) diffusion through iron corrosion products. Steady-state removal rates in the column reactor were up to 10 times faster between the inlet-end and the first sampling port than between the first sampling port and the effluent-end of the column. Faster removal near the influent-end of the column was due to a faster rate of iron oxidation in that region. The presence of 100 μg/L As(V) decreased the iron corrosion rate by up to a factor of 5 compared to a blank electrolyte solution. However, increasing the As(V) concentration from 100 to 20 000 μg/L resulted in no further decrease in the iron corrosion rate. The kinetics of arsenate removal ranged between zeroth- and first-order with respect to the aqueous As(V) concentration. The apparent reaction order was dependent on the availability of adsorption sites and on the aqueous As(V) concentration. X-ray absorption spectroscopy analyses showed the presence of iron metal, magnetite (Fe3O4), an Fe(III) oxide phase, and possibly an Fe(II, III) hydroxide phase in the reacted iron filings. These mixed valent oxide phases are not passivating and permit sustained iron corrosion and continuous generation of new sites for As(V) adsorption.

Reddad, Z., Gerente, C., Andres, Y. and Le Cloirec, P. (2002), Modeling of single and competitive metal adsorption onto a natural polysaccharide. *Environmental Science & Technology*, **36** (10), 2242-2248.

Full Text: [E\Env Sci Tec36, 2242.pdf](E/Env%20Sci%20Tec36,%202242.pdf)

Abstract: Sugar beet pulp, a common agricultural waste, was studied in the removal of metal ions from aqueous solutions. Potentiometric titrations were used to characterize the surface acidity of the polysaccharide. The acid properties of the material can be described by invoking three distinct types of surface functional groups with the intrinsic acidity constants (pK(a)(int)) values 3.43±0.1, 6.05±0.05, and 7.89±0.1, respectively. The contents of each functional group (i.e., the carboxyl and phenol moieties) were also determined. Then, a simple surface complexation model with the diffuse layer model successfully described the sorption of several metal ions (Cu2+, Zn2+, Cd2+, and Ni2+) onto the polysaccharide under various experimental, conditions: pH ranging from 2 to 5.5, ionic strength from 0.01 to 0.1 M, metal concentration between 10-4 and 10-3 M, for a constant sorbent concentration equal to 2.5 g.L-1. It was observed experimentally that the affinity of the polysaccharide was in the sequence of Cu2+ > Zn2+ > Cd2+ > Ni2+. Predictions of sorption in binary-metal systems based on single-metal data fits represented competitive sorption data reasonably well.

Keywords: Granular Activated Carbon, Sugar-Beet Pulp, Humic-Acid, Aqueous-Solution, Ion Adsorption, Proton Binding, Fly-Ash, Sorption, Removal, Oxide

Notes: highly cited

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Full Text: [2002\Env Sci Tec36, 2889.pdf](2002/Env%20Sci%20Tec36,%202889.pdf)

Abstract: Arsenic mobility in natural environments is controlled primarily by ‘sorption onto-metal oxide surfaces, and the extent of this sorption may be influenced strongly by the presence of other dissolved substances that interact with surfaces or with arsenic itself. Natural organic matter (NOM), a prevalent constituent of natural waters, is highly reactive toward both metals and surfaces and is thus a clear candidate to influence arsenic mobility. The objectives of this study, were therefore to reveal the influences of diverse,NOM samples on the sorption,of arsenic onto hematite, a model metal oxide, as well as to reveal influences of arsenic on the sorption of NOM, using conditions and concentrations relevant to natural freshwater environments Of the six NOM samples tested, four formed aqueous complexes with arsenate and arsenite. The extent of complexation varied with NOM origin and, in particular, increased with the cationic metal (primarily Fe) content of the NOM sample. In addition, every NOM sample showed active redox behavior toward arsenic species, indicating that NOM may greatly influence redox as well as complexation speciation of arsenic in freshwater environments. When NOM and As were incubated together with hematite, NOM,dramatically delayed the attainment of sorption equilibrium and diminished the extent of sorption of both arsenate and arsenite. Consistent with this result, when NOM and As were introduced sequentially, all NOV samples displaced sorbed arsenate and arsenite from hematite surfaces, and arsenic species similarly displayed sorbed NOM from hematite in significant quantities. Competition between NOM and As for sorption thus appears to be,a potentially important process in natural Waters, suggesting that NOM may play a greater role in arsenic mobility than previously recognized. In addition, in all,sorption experiments, arsenite was consistently desorbed or prevented from sorbing to a greater extent than arsenate, indicating that interactions with NOM may also partially explain the generally greater mobility of arsenite in natural environments.

Keywords: Adsorption, Equilibrium, Ferrihydrite, Kinetics, Metal, Metals, Mobilization, Oxidation, Oxide, pH, Reduction, Soils, Sorption, Surface-Chemistry

Gupta, V.K. and Sharma, S. (2002), Removal of cadmium and zinc from aqueous solutions using red mud. *Environmental Science & Technology*, **36** (16), 3612-3617.

Full Text: [E\Env Sci Tec36, 3612.pdf](E/Env%20Sci%20Tec36,%203612.pdf)

Abstract: Red mud, an aluminum industry waste, has been converted into an inexpensive and efficient adsorbent. The product obtained has been characterized and utilized in batch and column operations for the removal of cadmium and zinc from aqueous solutions over a wide range of initial metal ion concentrations (1.78×10-5 to 1.78×10-3 M for Cd2+ and 3.06×10-5 to 3.06×10-3 M for Zn2+, contact time, 24 h) adsorbent dose (5-20 g/L), and pH (1.0-6.0). The removal of Cd2+ and Zn2+ was almost complete at low concentrations, while it was 60-65% at higher concentrations at optimum pH’s of 4.0 and 5.0, respectively, with 10 g/L of adsorbent in an 8-10 h equilibration time. The adsorption decreased with increase in temperature. Kinetic studies have been used to describe the mechanism of adsorption. Chemical regeneration of the columns has been achieved with 1% HNO3.

Keywords: Industry Waste Material, Low-Cost Adsorbent, Metal-Cations, Fly-Ash, Water, Sorption, Lead, Adsorption, Slag, Ions

Weber, Jr., W.J., Kim, S.H. and Johnson, M.D. (2002), Distributed reactivity model for sorption by soils and sediments. 15. High-concentration co-contaminant effects on phenanthrene sorption and desorption. *Environmental Science & Technology*, **36** (16), 3625-3634.

Full Text: [E\Env Sci Tec36, 3625.pdf](E/Env%20Sci%20Tec36,%203625.pdf)

Abstract: Soil and sediment materials having organic matter matrixes of different geochemical character were examined with respect to their sorption and desorption of phenanthrene in the presence of order-of-magnitude larger concentrations of trichloroethylene (TCE) and dichlorobenzene (DCB). These co-contaminants depressed phenanthrene sorption in the lowest residual solution phase concentration ranges of that target solute investigated, whereas in its highest residual concentration regions phenanthrene sorption was either not affected or was actually enhanced. In both concentration ranges, the effects observed varied with the hydrophobicity and relative concentration of the co-contaminant and with the geological maturity and associated degree of condensation and aromatization of the soil/sediment organic matter (SOM). Desorption isotherms for phenanthrene indicate the occurrence of increased hysteresis in the presence of high concentrations of DCB and TCE, the effect increasing with increased degree of associated organic condensation. Tests in which high concentrations of DCB and TCE were added after completion of the phenanthrene desorption experiments show clear evidence of partial displacement of sorbed phenanthrene to the solution phase. The results of the work support the concept of SOM glass-transition concentrations, above which matrix deformation occurs and so-called “conditioning effects” are observed.

Keywords: Chemicals, Competitive Sorption, Displacement, Domains, Hysteresis, Irreversible Adsorption, Mechanisms, Nonequilibrium Sorption, Organic-Compounds, Sorbent

Jonker, M.T.O. and Koelmans, A.A. (2002), Sorption of polycyclic aromatic hydrocarbons and polychlorinated biphenyls to soot and soot-like materials in the aqueous environment mechanistic considerations. *Environmental Science & Technology*, **36** (17), 3725-3734.

Full Text: [E\Env Sci Tec36, 3725.pdf](E/Env%20Sci%20Tec36,%203725.pdf)

Abstract: Physical entrapment and pore sorption explain the extremely high observed sorption coefficients of PAHs and PCBs for a series of soot and soot-like materials.

Keywords: Carbon Surface-Chemistry, Natural Organic-Matter, Activated Carbon, Sediment Porewater, Aluminum Smelter, Lake Ketelmeer, Black Carbon, Humic-Acid, In-Situ, Water

Sánchez-Polo, M. and Rivera-Utrilla, J. (2002), Adsorbent-adsorbate interactions in the adsorption of Cd(II) and Hg(II) on ozonized activated carbons. *Environmental Science & Technology*, **36** (17), 3850-3854.

Full Text: [E\Env Sci Tec36, 3850.pdf](E/Env%20Sci%20Tec36,%203850.pdf)

Abstract: The present work investigated the effect of surface oxygenated groups on the adsorption of Cd(II) and Hg(II) by activated carbon. A study was undertaken to determine the adsorption isotherms and the influence of the pH on the adsorption of each metallic ion by a series of ozonized activated carbons. In the case of Cd(II), the adsorption capacity and the affinity of the adsorbent augmented with the increase in acid-oxygenated groups on the activated carbon surface. These results imply that electrostatic-type interactions predominate in this adsorption process. The adsorption observed at solution pH values below the pHPZC of the carbon indicates that other forces also participate in this process. Ionic exchange between -Cπ-H3O+ interaction protons and Cd(II) ions would account for these findings. In the case of Hg(II), the adsorption diminished with an increase in the degree of oxidation of the activated carbon. The presence of electron-withdrawing groups on oxidized carbons decreases the electronic density of their surface, producing a reduction in the adsorbentadsorbate dispersion interactions and in their reductive capacity, thus decreasing the adsorption of Hg(II) on the activated carbon. At pH values above 3, the pH had no influence on the adsorption of Hg(II) by the activated carbon, confirming that electrostatic interactions do not have a determinant influence on Hg(II) adsorption.

Notes: highly cited

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Fell text: [2002\Env Sci Tec36, 3855.pdf](2002/Env%20Sci%20Tec36,%203855.pdf)

Abstract: The elimination of selected pharmaceuticals (bezafibrate clofibric acid carbamazepine diclofenac) during drinking water treatment processes was investigated at lab and pilot scale and in real waterworks No significant removal of pharmaceuticals was observed in batch experiments with sand under natural aerobic and anoxic conditions thus indicating low sorption properties and high persistence with nonadapted microorganisms These results were underscored by the presence of carbamazepine in bank filtrated water with anaerobic conditions in a waterworks area Flocculation using iron(III) chloride in lab scale experiments (Jar test) and investigations in waterworks exhibited no significant elimination of the selected target pharmaceuticals However ozonation was in some cases very effective in eliminating these polar compounds In lab scale experiments 0 5 mg, L ozone was shown to reduce the concentrations of diclofenac and carbamazepine by more than 90% while bezafibrate was eliminated by 50% with a 15 mg, L ozone dose Clofibric acid was stable even at 3 mg, L ozone Under waterworks conditions similar removal efficiencies were observed In addition to ozonation filtration with granular activated carbon (GAC) was very effective in removing pharmaceuticals Except for clofibric acid GAC in pilot scale experiments and waterworks provided a major elimination of the pharmaceuticals under investigation.

Keywords: Acid, Activated Carbon, Aerobic, Anaerobic, Anaerobic Conditions, Anoxic, Batch, Batch Experiments, Carbamazepine, Carbon, Chloride, Clofibric Acid, Concentrations, Dissociating Organic-Compounds, Drinking, Drinking Water, Drinking Water Treatment, Drugs, Effective, Elimination, Environment, Experiments, Fate, Filtration, Flocculation, GAC, Granular, Granular Activated Carbon, Inorganic-Compounds, Investigation, Investigations, Iron(III), Low, Major, Microorganisms, Natural, Ozonation, Ozone, Persistence, Pharmaceuticals, Pilot, Pilot Scale, Polar, Properties, Rate Constants, Removal, Removing, Sand, Scale, Sorption, Sorption Properties, Test, Treatment, Water, Water Treatment, Waterworks

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Full Text: [2002\Env Sci Tec36, 4003.pdf](2002/Env%20Sci%20Tec36,%204003.pdf)

Keywords: Comment on, Contaminants, Hormones, Organic, Retention Indexes, Streams, US, Wastewater

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Full Text: [2002\Env Sci Tec36, 4004.pdf](2002/Env%20Sci%20Tec36,%204004.pdf)

Keywords: Contaminants, Hormones, Organic, Streams, Us, Wastewater, Water

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Full Text: [2002\Env Sci Tec36, 4005.pdf](2002/Env%20Sci%20Tec36,%204005.pdf)

Keywords: Comment On, Contaminants, Estrogenic Hormones, Germany, Hormones, Organic, Streams, Surface-Water, US, Wastewater, Water Samples

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Full Text: [2002\Env Sci Tec36, 4007.pdf](2002/Env%20Sci%20Tec36,%204007.pdf)

Keywords: Contaminants, Hormones, Municipal, Organic, Streams, US, Wastewater

Drexel, R.T., Haitzer, M., Ryan, J.N., Aiken, G.R. and Nagy, K.L. (2002), Mercury(II) sorption to two Florida Everglades peats: Evidence for strong and weak binding and competition by dissolved organic matter released from the peat. *Environmental Science & Technology*, **36** (19), 4058-4064.

Full Text: [E\Env Sci Tec36, 4058.pdf](E/Env%20Sci%20Tec36,%204058.pdf)

Abstract: The binding of mercury(II) to two peats from Florida Everglades sites with different rates of mercury methylation was measured at pH 6.0 and 0.01 M ionic strength. The mercury(II) sorption isotherms, measured over a total mercury(II) range of 10-7.4 to 10-3.7 M, showed the competition for mercury(II) between the peat and dissolved organic matter released from the peat and the existence of strong and weak binding sites for mercury(II). Binding was portrayed by a model accounting for strong and weak sites on both the peat and the released DOM. The conditional binding constants (for which the ligand concentration was set as the concentration of reduced sulfur in the organic matter as measured by X-ray absorption near-edge structure spectroscopy) determined for the strong sites on the two peats were similar (K-peat, K-s = 10(21.8±01) and 10(22.0±0.1) M-1), but less than those determined for the DOM strong sites (K-dom, K-s = 10(22.8±0.1) and 10(23.2±0.1) M-1), resulting in mercury(II) binding by the DOM at low mercury(II) concentrations. The magnitude of the strong site binding constant is indicative of mercury(II) interaction with organic thiol functional groups. The conditional binding constants determined for the weak peat sites (K-peat, K-w = 10(11.5±0.1) and 10(11.8±0.1) M-1) and weak DOM sites (K-dom, K-w = 10(8.7±3.0) and 10(7.3±4.5) M-1) were indicative of mercury(II) interaction with carboxyl and phenol functional groups.

Keywords: Soil Humic Substances, Sediment Pore Waters, Methylating Bacteria, Mercuric Sulfide, Natural-Waters, Reduced Sulfur, Speciation, Complexation, Hg(II), Bioavailability

Manning, B.A., Hunt, M.L., Amrhein, C. and Yarmoff, J.A. (2002), Arsenic(III) and Arsenic(V) reactions with zerovalent iron corrosion products. *Environmental Science & Technology*, **36** (24), 5455-5461.

Full Text: [E\Env Sci Tec36, 5455.pdf](E/Env%20Sci%20Tec36,%205455.pdf)

Abstract: Zerovalent iron (Fe-0) has tremendous potential as a remediation material for removal of arsenic from groundwater and drinking water. This study investigates the speciation of arsenate (As(V)) and arsenite (As(III)) after reaction with two Fe-0 materials, their iron oxide corrosion products, and several model iron oxides. A variety of analytical techniques were used to study the reaction products, including HPLC-hydride generation atomic absorption spectrometry, X-ray diffraction, scanning electron microscopy-energy-dispersive X-ray analysis, and X-ray absorption spectroscopy. The products of corrosion of Fe-0 include lepidocrocite (gamma-FeOOH), magnetite (Fe3O4), and/or maghemite (gamma-Fe3O4), all of which indicate Fe(II) oxidation as an intermediate step in the Fe-0 corrosion process. The in-situ Fe-0 corrosion reaction caused a high As(III) and As(V) uptake with both Fe-0 materials studied. Under aerobic conditions, the Fe-0 corrosion reaction, did not cause As(V) reduction to As(III) but did cause As(III) oxidation to As(V). Oxidation of As(III) was also caused by maghemite and hematite minerals indicating that the formation of certain iron oxides during Fe-0 corrosion favors the As(V) species. Water reduction and the release of OH- to solution on the surface of corroding Fe-0 may also promote As(III), oxidation. Analysis of As(III) and As(V) adsorption complexes in the NO corrosion products and synthetic iron oxides by extended X-ray absorption fine structure spectroscopy (EXAFS) gave predominant As-Fe interatomic distances of 3.30-3.36 Angstrom. This was attributed to inner-sphere, bidentate As(III) and As(V) complexes. The results of this study suggest that Fe-0 can be used as a versatile and economical sorbent for in-situ treatment of groundwater containing As(III) and As(V).

Keywords: Zero-Valent Iron, Absorption Fine-Structure, In-Situ Remediation, Removal, Groundwater, Water, Arsenate, Contamination, Speciation, Coagulation

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Full Text: [2003\Env Sci Tec37, 99.pdf](2003/Env%20Sci%20Tec37,%2099.pdf)

Abstract: We hypothesized that the sorption of polycyclic aromatic hydrocarbons (PAHs) to natural sediments and soils should consider both absorption into a biogenic/diagenetic organic carbon (OC) fraction and adsorption onto a combustion-derived, black carbon (BC) fraction. Here, two sets of literature data were reevaluated to illustrate that an OC absorbent and a BC adsorbent together can (1) account for sediment-pore-water distribution coefficients observed in the field that are greater than predicted by a simple f(oc)K(oc) partitioning model and (2) explain a group of nonlinear phenanthrene isotherms observed in the laboratory with a single value for the BC-normalized distribution coefficient (log K-BC = 6.1±0.04) and a Freundlich exponent (n approximate to 0.6 if log K-oc = 4.0) that is strongly dependent on the K-oc value selected.

Keywords: Polycyclic Aromatic-Hydrocarbons, Distributed Reactivity Model, Marine Harbor Sediments, Polychlorinated-Biphenyls, Hydrophobic Pollutants, Anaerobic Degradation, Natural Sediments, Boston-Harbor, Soils, Bioavailability

Kim, J.Y., Davis, A.P. and Kim, K.W. (2003), Stabilization of available arsenic in highly contaminated mine tailings using iron. *Environmental Science & Technology*, **37** (1), 189-195.

Full Text: [E\Env Sci Tec37, 189.pdf](E/Env%20Sci%20Tec37,%20189.pdf)

Abstract: To evaluate the stabilization of available As in contaminated tailings from two abandoned metal mines of South Korea (the Myoungbong and Daduck Mines, 6670 and 56 600 mg/kg total As, respectively), characteristics of the tailings were investigated, and the tailings were treated through precipitation of amorphous iron compounds. Steep decreasing trends of extractable (5% NaOCI) As with increasing initial Fe(III) additions were observed in both treated tailings. In general, the treated tailings had the lowest extractable As concentration at pH 6. Available As, defined as the sum of As concentrations for the first four steps of a sequential extraction, was reduced from 2090 to 428 mg/kg (80% reduction) in the Myoungbong tailings and from 1320 to 395 mg/kg (70% reduction) in the Daduck tailings. As levels in the treated tailings decreased even more after a 1-month dormant period. Adsorption/ coprecipitation tests performed with mixed As(III) and Fe(III) solutions demonstrated dramatically increased As sequestration via interaction with amorphous iron compounds with increasing pH. The bulk of the As appeared to be affiliated with stable Fe precipitates.

Keywords: Drinking-Water, Cancer Mortality, Soils, Adsorption, Ferrihydrite, Goethite, Chemistry, Bladder, Immobilization, Speciation

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Full Text: [2003\Env Sci Tec37, 852.pdf](2003/Env%20Sci%20Tec37,%20852.pdf)

Abstract: The sorption of phenanthrene was examined in humic acids (HAs) from different sources: a compost, a peat soil, and a mineral soil. Sub-samples of each HA were subjected to bleaching or hydrolysis to remove predetermined chemical groups from their structures. Bleaching successfully removed a large percentage of rigid, aromatic moieties, whereas hydrolysis removed the mobile, carbohydrate components. Phenanthrene sorption by all HAs was nonlinear (N < 1). However, the phenanthrene isotherms of the bleached HAs were more linear than those of the untreated HAs,whereas the removal of the carbohydrate components by hydrolysis produced more nonlinear isotherms. The introduction of pyrene to the phenanthrene sorption system yielded more linear isotherms for all the HAs, indicative of competitive sorption. Proton spin-spin (H-1 T-2) relaxation determined by nuclear magnetic resonance (NMR) was used to identify separate rigid (condensed) and flexible (expanded) H-1 populations and to determine their distribution. These H-1 domains were highly sensitive to temperature and correlated well with reported glass transition temperatures for HAS. In combination with the chemical treatments, sorption, and spectroscopic data, we were able to observe some significant relationships among chemical groups, sorption behavior, and structural characteristics.

Keywords: Acids, Aromatic, Behavior, Bleaching, Carbohydrate, Characterization, Chemical, Chemical Modifications, Compost, Contaminant, Desorption-Kinetics, Distributed Reactivity Model, Distribution, Glass Transition, Glass-Transition, H-1, Has, Humic, Humic Acids, Hydrolysis, Isotherms, Macromolecular Characteristics, Magnetic, Matter, Mineral, NMR, Organic, Organic Matter, Phenanthrene Sorption, Polycyclic Aromatic-Hydrocarbons, Relaxation, Soil, Soil Organic Matter, Sorption, Sources, Substances, Temperature

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Full Text: [2003\Env Sci Tec37, 1052.pdf](2003/Env%20Sci%20Tec37,%201052.pdf)

Keywords: Comment on, Contaminants, Distributional Parameters, Hormones, Mar, Organic, Streams, US, Wastewater, Water-Quality Data

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Full Text: [2003\Env Sci Tec37, 1054.pdf](2003/Env%20Sci%20Tec37,%201054.pdf)

Keywords: Contaminants, Hormones, Mar, Organic, Streams, US, Wastewater

Aldrich, M.V., Gardea-Torresdey, J.L., Peralta-Videa, J.R. and Parsons, J.G. (2003), Uptake and reduction of Cr(VI) to Cr(III) by mesquite (*Prosopis* spp.): Chromate-plant interaction in hydroponics and solid media studied using XAS. *Environmental Science & Technology*, **37** (9), 1859-1864.

Full Text: [E\Env Sci Tec37, 1859.pdf](E/Env%20Sci%20Tec37,%201859.pdf)

Abstract: Chromium (Cr) is a well-established carcinogen that is a contaminant at half of the EPA Superfund sites in the United States. Two separate studies were performed to investigate the possibility that mesquite (*Prosopis* spp.), which is an indigenous desert plant species, can remove Cr from the environment via active transport systems to the aerial portions of the plant. The first study was performed by growing mesquite on solid media (agar) at Cr(VI) concentrations of 75 and 125 ppm. The accumulation found in the leaves under the present conditions indicated that mesquite could be classified as a hyperaccumulator of chromium. The second study was conducted to investigate the differences between the type of Cr ligand involved in Cr uptake with agar and hydroponic cultures. We used X-ray absorption spectroscopy (XAS) to determine the mechanisms involved in the uptake and binding of Cr(VI) in live mesquite tissue. The XAS results for this study showed that some of the supplied Cr(VI) was uptaken by the mesquite roots, however, the data analyses of the plant tissues demonstrated that it was fully reduced to Cr(III) in the leaf tissues. Experiments are currently being performed to evaluate the behavior of the Mesquite plant using lower Cr concentrations.

Keywords: Heavy-Metal Detoxification, Ray-Absorption Spectroscopy, Hexavalent Chromium, Larrea-Tridentata, Creosote Bush, Transport, Binding, Alfalfa, Sativa, Phytoremediation

Yun, Y.S. and Volesky, B. (2003), Modeling of lithium interference in cadmium biosorption. *Environmental Science & Technology*, **37** (16), 3601-3608.

Full Text: [E\Env Sci Tec37, 3601.pdf](E/Env%20Sci%20Tec37,%203601.pdf)

Abstract: Biosorption of Cd by the brown seaweed Sargassum polycystum biomass was experimentally investigated and mathematically modeled at different pH and ionic strength levels. From the potentiometric titration of the biomass, three types of functional groups were identified, and the dissociation constant and the numbers of these groups were determined. The carboxyl group (pK(H) 3.70±0.09) was found to play a major role in binding protons and Cd. The background ion, Li+, could interfere with the uptake of protons and Cd by competition for the carboxyl sites. Whereas the binding mechanism on the carboxyl group was established as an ion exchange process, the second functional group, phosphonate (pK(H) 5.41±0.31), most likely bound metals by a complexation reaction. A biosorption model was developed based upon the binding mechanisms and was successfully used for predicting the isotherm and pH edge experiments. In addition, the speciation of the binding sites as a function of the pH was simulated using the developed model in order to visualize the distribution of Cd on the binding sites.

Keywords: Heavy-Metal Biosorption, Cobalt Biosorption, Ionic-Strength, Waste Biomass, Seaweed, Protons, Biosorbent, Alginate, Exchange, Sorbents

Notes: highly cited

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Full Text: [2003\Env Sci Tec37, 4182.pdf](2003/Env%20Sci%20Tec37,%204182.pdf)

Abstract: Arsenic derived from natural sources occurs in groundwater in many countries, affecting the health of millions of people. The combined effects of As(V) reduction and diagenesis of iron oxide minerals on arsenic mobility are investigated in this study by comparing As(V) and As(III) sorption onto amorphous iron oxide (HFO), goethite, and magnetite at varying solution compositions. Experimental data are modeled with a diffuse double layer surface complexation model, and the extracted model parameters are used to examine the consistency of our results with those previously reported. Sorption of As(V) onto HFO and goethite is more favorable than that of As(III) below pH 5-6, whereas, above pH 7-8, As(III) has a higher affinity for the solids. The pH at which As(V) and As(III) are equally sorbed depends on the solid-to-solution ratio and type and specific surface area of the minerals and is shifted to lower pH values in the presence of phosphate, which competes for sorption sites. The sorption data indicate that, under most of the chemical conditions investigated in this study, reduction of As(V) in the presence of HFO or goethite would have only minor effects on or even decrease its mobility in the environment at near-neutral pH conditions. As(V) and As(III) sorption isotherms indicate similar surface site densities on the three oxides. Intrinsic surface complexation constants for As(V) are higher for goethite than HFO, whereas As(III) binding is similar for both of these oxides and also for magnetite. However, decrease in specific surface area and hence sorption site density that accompanies transformation of amorphous iron oxides to more crystalline phases could increase arsenic mobility.

Keywords: Competitive Adsorption, Ferrihydrite, Goethite, Groundwater, Hydrous Ferric-Oxide, Isotherms, Mobilization, Phosphate, Reduction, Sorption, Surface Area, Surface Complexation, West-Bengal

Dupont, L. and Guillon, E. (2003), Removal of hexavalent chromium with a lignocellulosic substrate extracted from wheat bran. *Environmental Science & Technology*, **37** (18), 4235-4241.

Full Text: [E\Env Sci Tec37, 4235.pdf](E/Env%20Sci%20Tec37,%204235.pdf)

Abstract: In this paper, anew recovery system of the toxic hexavalent chromium Cr(VI) is proposed that uses a lignocellulosic substrate derived from the industrial treatment process of wheat bran. We studied the adsorption mechanism of Cr(VI) onto the lignocellulosic substrate and showed that the adsorption reaction consumes a large amount of protons goes along the reduction of Cr(VI) into Cr(III). The oxidation of lignin moieties takes place concurrently to the chromium reduction and leads to the formation of hydroxyl and carboxyl functions. The latter contribute to an increase in the number of ion-exchange sites for the reduced chromium. The maximum adsorption capacity for hexavalent chromium was found at about 35 mg g-1 in an acidic medium. This is comparable to other natural substrates and ordinary adsorbents.

Keywords: Aqueous-Solutions, Activated Carbon, Spectroscopy, Adsorption, Cr(VI), Waste, XPS

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Full Text: [2003\Env Sci Tec37, 5057.pdf](2003/Env%20Sci%20Tec37,%205057.pdf)

Abstract: Hexadecyltrimethylammonium (HDTMA)-modified montmorillonite (HMM) has recently been recognized as a potential sorbent to remove organic contaminants from environmental systems. Potential applications of this material highly depend on the efficiency of regenerating contaminant-sorbing HMM. In this study, we investigated a chemical (NaOH solution) and a biological (yeast Pityrosporum sp.) method to regenerate phenol-sorbing HMM. Our results showed that the sorption coefficient of phenol to HMM is not a linear function of the ratio of the substitution of HDTMA in HMM. Chemical regeneration of HMMs (0-0.7 times of its cation exchange capacity (CEC)) proved the existence of a phenol residual amount of about 3 mg(.)g-1 in the HMMs tested when aqueous pH is maintained above 11. In addition, the obvious deductions in the sorption capacity of the chemically regenerated HMMs were observed after four cycles of sorption-regeneration. However, the sorption capacities of intermediate substituted HMMs (0.3-0.7 CEC) can be completely restored by bioregeneration with yeast for extended cycles of reuse. The results imply that the bioregeneration method with yeast could be a promising technique for in-situ bioremediation of phenol-contaminated groundwater in the subsurface or for treatment of phenol containing wastewater.

Keywords: Adsorption, Applications, Bentonite, Biodegradation, Bioremediation, Capacity, Cation Exchange Capacity, Chemical, Contaminants, Degradation, Efficiency, Environmental, Groundwater, HDTMA, In Situ, Montmorillonite, Organic, Organic Contaminants, Organobentonite, pH, Phenol, Pseudomonas-Putida, Regeneration, Removal, Reuse, Soils, Sorption, Sorption Capacity, Treatment, Wastewater, Water, Yeast

Jang, M., Shin, E.W., Park, J.K. and Choi, S.I. (2003), Mechanisms of arsenate adsorption by highly-ordered nano-structured silicate media impregnated with metal oxides. *Environmental Science & Technology*, **37** (21), 5062-5070.

Full Text: [E\Env Sci Tec37, 5062.pdf](E/Env%20Sci%20Tec37,%205062.pdf)

Abstract: The highly ordered mesoporous silica media, SBA-15, was synthesized and incorporated with iron, aluminum, and zinc oxides using an incipient wetness impregnation technique. Adsorption capacities and kinetics of meta I-impregnated SBA-15 were compared with activated alumina which is widely used for arsenic removal. Media impregnated with 10% of aluminum by weight (designated to Al(10)SBA-15) had 1.9-2.7 times greater arsenate adsorption capacities in a wide range of initial arsenate concentrations and a 15 times greater initial sorption rate at pH 7.2 than activated alumina. By employing one- and two-site models, surface complexation modeling was conducted to investigate the relationship between the aluminum oxidation states in different media and adsorption behaviors shown by adsorption isotherms and kinetics since the oxidation phase of aluminum incorporated onto the surface of SBA-15 was Al-O, which has a lower oxidation state than activated alumina (Al2O3). Surface complexation modeling results for arsenate adsorption edges conducted with different pH indicated that the monodentate complex (SAsO42-) was dominant in Al(10)SBA-15, while bidentate complexes (XHAsO4 and XAsO4-) were dominant in activated alumina at pH 7.2, respectively. In kinetic studies at pH 7.2±0.02, Al(10)SBA-15 had only a fast-rate step of initial adsorption, while activated alumina had fast- and slow-rate steps of arsenate adsorption. Therefore, it can be inferred that the monodentate arsenate complex, predominant in Al(10)SBA-15, leads to faster adsorption rates than bidentate arsenate complexes favored with activated alumina. An arsenate adsorption behavior and arsenate surface complexation were thought to be well explained by aluminum oxidation states and surface structural properties of media.

Keywords: Chromate Retention Mechanisms, SBA-15 Mesoporous Silica, Aqueous-Solution, Molecular-Sieve, Kinetic-Models, Removal, Sorption, Goethite, Water, Equilibrium

Janoš, P. (2003), Sorption of basic dyes onto iron humate. *Environmental Science & Technology*, **37** (24), 5792-5798.

Full Text: [E\Env Sci Tec37, 5792.pdf](E/Env%20Sci%20Tec37,%205792.pdf)

Abstract: Iron humate (IH) was examined as a new low-cost sorbent for removing basic dyes (Methylene Blue, Methyl Violet, Crystal Violet, Malachite Green, and Rhodamine B) from waters. The sorption of the dyes from aqueous solutions was described by a multisite Langmuir isotherm, the sorption capacities ranging from ca. 0.01 to 0.09 mmol/g were calculated from the parameters of the isotherm for individual dyes. A more detailed study was carried out with Methylene Blue to examine an influence of the composition of aqueous phase on the sorption. pH and the presence of inorganic salts have only minor effects on the sorption. The presence of anionic surfactant (sodium dodecyl sulfate, SIDS) increases dramatically the sorption of Methylene Blue. A model describing the sorption of basic (cationic) dyes in the presence of anionic surfactants was proposed, two main mechanisms are considered in this model: the sorption of cationic dyes onto the polar (or cation-exchange) active sites and the sorption of relatively small dye-surfactant aggregates onto the nonpolar part of the sorbent. Experimental dependencies comply well with those predicted from the model. Both in the presence as well as in the absence of SIDS, the dye sorption proceeds relatively quickly-most of the dye is sorbed within the first several hours. Leachability of the dye from the loaded sorbent was found to be very low, especially with water as leachant.

Keywords: Aqueous-Solution, Humic Acids, Surfactant Interactions, Natural Hematite, Dodecyl-Sulfate, Waste-Water, Fly-Ash, Removal, Adsorption, Coal

? Cornelissen, G. and Gustafsson, O. (2004), Sorption of phenanthrene to environmental black carbon in sediment with and without organic matter and native sorbates. *Environmental Science & Technology*, **38** (1), 148-155.

Full Text: [2004\Env Sci Tec38, 148.pdf](2004/Env%20Sci%20Tec38,%20148.pdf)

Abstract: Strong sorption to soot- and charcoal-like material (collectively termed black carbon or BC) in soils and sediments is possibly the reason for recent observations of elevated geosorbent-water distribution ratios, slow desorption, limited uptake, and restricted bioremediation. We evaluated the role of environmental BC in the sorption of phenanthrene (PHE) to a polluted lake sediment from a Rhine River sedimentation area. Sorption isotherms were determined over a wide concentration range (0.0005-6 mug/ L) for the original sediment (with organic matter or OM, native sorbates, and BC), sediment from which we had stripped >90% of the native sorbates (only OM and BC), and sediment combusted at 375 degreesC (only BC). The sorption isotherms of the original and stripped sediments were almost linear (Freundlich coefficient or n(F) > 0.9), whereas the isotherm of the BC remaining after the sediment combustion was highly nonlinear (n(F) = 0.54). At low concentrations (ng/L range), PHE sorption to BC in the combusted sediment was found to exceed the total PHE sorption in the original and stripped sediments. This implies that it may not be possible to use a BC-water sorption coefficient measured in combusted sediment to estimate total sorption to the original sediment. This “intrinsic” BC-water sorption coefficient after combustion was calculated to be 9 times larger than the “environmental” one in the untreated sediment. Competition between the added PHE and the native PAHs and/or OM may explain this difference. It appears that, at low aqueous PHE concentrations (ng/L and below), BC is the most important geosorbent constituent with respect to sorption. At higher concentrations (mug/L), BC sorption sites become saturated and BC sorption is overwhelmed by sorption to the other OM constituents. Because sorption is a central process affecting contaminant behavior and ecotoxicity, understanding this process can strongly contribute to risk assessment and fate modeling.

Keywords: Polycyclic Aromatic-Hydrocarbons,Distributed Reactivity Model, Activated Carbon, Relative Concentrations, Continental-Shelf, Surface-Area, Soot, Adsorption, Soils, Chemicals

? Cruz-Guzmán, M., Celis, R., Hermosín, M.C. and Cornejo, J. (2004), Adsorption of the herbicide simazine by montmorillonite modified with natural organic cations. *Environmental Science & Technology*, **38** (1), 180-186.

Full Text: [2004\Env Sci Tec38, 180.pdf](2004/Env%20Sci%20Tec38,%20180.pdf)

Abstract: Three organic cations with a natural origin (L-carnitine, L-cystine dimethyl ester, and thiamine) were introduced at different loadings in the interlayer of a low-charge montmorillonite, and the performance of the modified clays as adsorbents of the herbicide simazine was investigated using batch adsorption-desorption experiments. The organic cations were selected on the basis of their natural origin and the presence of diverse functional groups in their structures, which was expected to influence simazine adsorption. Elemental analysis and spectroscopy results demonstrated the presence of the organic cations in the modified montmorillonites and their entrance in the clay mineral interlayers. Batch adsorption results showed that modification with thiamine (K-f = 96-138), cystine dimethyl ester (K-f = 400-753), and especially carnitine (K-f > 10 000) enhanced the adsorption of simazine by montmorillonite (K-f = 28-47). It appeared that the specific interlayer microenvironment provided by the functional groups of each organic cation was an important factor controlling the adsorption efficiency of the modified clays. For carnitine and cystine dimethyl ester, the increase in simazine adsorption was considerably greater than that observed after montmorillonite modification with “classical” alkylammonium cations, such as phenyltrimethylammonium or hexadecyltrimethylammonium. This illustrated how modification of smectitic clay minerals with natural organic cations containing appropriate functional groups can be a useful strategy to improve the performance of organoclays for the removal of specific organic pollutants from the environment.

Keywords: Adsorption, Adsorption-Desorption, Analysis, Atrazine, Clay, Clay Minerals, Clays, Controlled-Release, Desorption, Efficiency, Environment, Functional Groups, Herbicide, Hexadecyltrimethylammonium, Humic Acids, Mineral, Modification, Montmorillonite, Natural, Organic, Organic Pollutants, Organoclays, Performance, Pollutants, S-Triazine, Simazine, Smectites, Soils, Sorption, Spectroscopy, Strategy

Liao, X.P., Lu, Z.B., Du, X., Liu, X. and Shi, B. (2004), Collagen fiber immobilized *Myrica* *rubra* tannin and its adsorption to UO22+. *Environmental Science & Technology*, **38** (1), 324-328.

Full Text: [E\Env Sci Tec38, 324.pdf](E/Env%20Sci%20Tec38,%20324.pdf)

Abstract: Tannins, which are rich in ortho-hydroxyl groups, have a high affinity for UO22+. In this paper, Myrica rubra tannin was immobilized on collagen fiber by an aldehydic cross-linking reaction to prepare a novel adsorbent for uranium (UO22+) recovery from wastewater. The adsorption equilibrium, the adsorption kinetics, and the effects of temperature and pH on the adsorption equilibrium were investigated in detail. It was found that the Myrica rubra tannin immobilized on collagen fiber exhibits an excellent adsorption capacity for UO22+. The adsorption capacity at 293 K and pH 5.0 was as high as 1.19 mmol UO22+/g (283.3 mgU/g) when the initial concentration of UO22+ in solution was 7.5 mmol/L. The adsorption isotherms could be described by the Freundlich equation, and the increase of temperature promoted the adsorption to UO22+. The adsorption kinetics data were fitted very well by the pseudo-second-order rate model, and the equilibrium adsorption capacity calculated by the pseudo-second-order rate model was almost the same as that determined by the actual measurement with the error less than or equal to 4%. The pH has a significant effect on the adsorption process. According to our experiments, the suitable pH scope should be 5-8.

Keywords: Uranium, Recovery, Behavior, Sorption, U(VI), Ions

Um, W. and Papelis, C. (2004), Metal ion sorption and desorption on zeolitized tuffs from the Nevada Test Site. *Environmental Science & Technology*, **38** (2), 496-502.

Full Text: [E\Env Sci Tec38, 496.pdf](E/Env%20Sci%20Tec38,%20496.pdf)

Abstract: Because of the hundreds of nuclear weapon tests conducted on the Nevada Test Site (NTS) during the Cold War, the migration of radionuclides and contaminants is a potential concern. The mobility of these compounds and our ability to remediate contaminated sites are controlled by sorption and desorption processes, which depend frequently on the nature of the contaminant, the mineralogy of the site, and the geochemical conditions. The sorption and desorption behavior of strontium (Sr) and lead (Pb), two metal cations with different chemistries, commonly found on nuclear test sites were studied. Strontium showed pH-independent and ionic-strength-dependent sorption, consistent with ion exchange processes at permanent charge sorption sites. The sorption uptake of Sr increased with decreasing ionic strength of background solution. Strontium desorption from the adsorbents was enhanced by increased background electrolyte concentration and was a function of background electrolyte composition. The fractional uptake of Pb was higher, compared to that of Sr, and was only pH dependent at the highest ionic strength used (1.0 M). This pH-dependent sorption behavior, consistent with formation of surface complexes at amphoteric surface hydroxyl sites or formation of surface precipitates, could explain the decreased Pb desorption, compared to that of Sr, especially at increased background electrolyte concentrations. Under conditions typical for the groundwater at the NTS (I = 0.003 M, pH = 8.0), both Pb and Sr are expected to bind strongly on tuffs with composition similar to the zeolitized tuffs used in this study. Any increase in the dissolved ion concentration of the groundwater, however, may result in, at least partial, release of Sr and enhanced Sr mobility.

Keywords: Adsorption, Cadmium, Cesium, Clay-Minerals, Exchange, Ion Exchange, Lead, Natural Clinoptilolite, Removal, Sorption, Strontium, Water Interfaces

Shin, E.W., Han, J.S., Jang, M., Min, S.H., Park, J.K. and Rowell, R.M. (2004), Phosphate adsorption on aluminum-impregnated mesoporous silicates: Surface structure and behavior of adsorbents. *Environmental Science & Technology*, **38** (3), 912-917.

Full Text: [E\Env Sci Tec38, 912.pdf](E/Env%20Sci%20Tec38,%20912.pdf)

Abstract: Phosphorus from excess fertilizers and detergents ends up washing into lakes, creeks, and rivers. This overabundance of phosphorus causes excessive aquatic plant and algae growth and depletes the dissolved oxygen supply in the water. In this study, aluminum-impregnated mesoporous adsorbents were tested for their ability to remove phosphate from water. The surface structure of the materials was investigated with X-ray diffraction (XRD), a N2 adsorption-desorption technique, Fourier transform-infrared (FT-IR), and X-ray photoelectron spectroscopy (XPS) to understand the effect of surface properties on the adsorption behavior of phosphate. The mesoporous materials were loaded with Al components by reaction with surface silanol groups. In the adsorption test, the Al-impregnated mesoporous materials showed fast adsorption kinetics as well as high adsorption capacities, compared with activated alumina. The uniform mesopores of the Al-impregnated mesoporous materials caused the diffusion rate in the adsorption process to increase, which in turn caused the fast adsorption kinetics. High phosphate adsorption capacities of the Al-impregnated mesoporous materials were attributed to not only the increase of surface hydroxyl density on Al oxide due to well-dispersed impregnation of Al components but also the decrease in stoichiometry of surface hydroxyl ions to phosphate by the formation of monodentate surface complexes.

Keywords: Chromate Retention Mechanisms, Waste-Water, Aqueous-Solutions, Pillared Clays, Removal, Phosphorus, Oxidation, Arsenate, Oxides, XPS

Kim, Y., Kim, C., Choi, I., Rengaraj, S. and Yi, J. (2004), Arsenic removal using mesoporous alumina prepared via a templating method. *Environmental Science & Technology*, **38** (3), 924-931.

Full Text: [E\Env Sci Tec38, 924.pdf](E/Env%20Sci%20Tec38,%20924.pdf)

Abstract: The health threat of arsenic is well-known, and the U.S. EPA recommends the maximum contaminant level to be 0.01 ppm or less for arsenic in drinking water. Therefore, advanced treatment processes are needed for finished water to meet the required regulations. Adsorption is considered to be a less expensive procedure that is safer to handle than precipitation, ion exchange, and membrane filtration. Activated alumina (AA) is the most commonly used adsorbent for the removal of arsenic from aqueous solutions. However, conventional porous solids including AA have ill-defined pore structures and, typically, low adsorption capacities and act in a kinetically slow manner. An ideal adsorbent should have uniformly accessible pores, an interlinked pore system, a high surface area, and physical and/or chemical stability. To meet this requirement, mesoprous alumina (MA) with a wide surface area (307 m2/g) and uniform pore size (3.5 nm) was prepared, and a spongelike interlinked pore system was developed through a post-hydrolysis method. The resulting MA was insoluble and stable within the range of pH 3-7. The maximum uptake of As(V) by MA was found to be 7 times higher [121 mg of As(V)/g and 47 mg of As(III)/g] than that of conventional AA, and the kinetics of adsorption were also rapid with complete adsorption in less than 5 h as compared to the conventional AA (about 2 d to reach half of the equilibrium value). A desorption study using sodium hydroxide solutions (0.01-1 M) was conducted, and 0.05 M NaOH was found to be the most suitable desorption agent. More than 85% of the arsenic adsorbed to the MA was desorbed in less than 1 h. Several other activated aluminas with different pore properties were also tested. The results show that the surface area of the adsorbents does not greatly influence on the adsorption capacity. In fact, the key factor is a uniform pore size and an interlinked pore system. These studies show that MA with a wide surface area, uniform pore size, and interlinked pore system can be used as an efficient adsorbent for the removal of arsenic.

Jain, A.K., Gupta, V.K., Jain, S. and Suhas (2004), Removal of chlorophenols using industrial wastes. *Environmental Science & Technology*, **38** (4), 1195-1200.

Full Text: [E\Env Sci Tec38, 1195.pdf](E/Env%20Sci%20Tec38,%201195.pdf)

Abstract: Development of inexpensive adsorbents from industrial wastes for the treatment of wastewaters is an important area in environmental sciences. Blast furnace slag, dust and sludge from steel plants, and carbon slurry from fertilizer plants after their treatment have been utilized as inexpensive adsorbents for the removal of phenols, which are an important class of pollutants as they are highly toxic. The characterization of the four adsorbents prepared has shown that the carbonaceous adsorbent prepared from carbon slurry possesses high porosity and maximum surface area (380 m2/g) as compared to the other three adsorbents (4-28 m2/g). The adsorption of four phenols (phenol, 2-chlorophenol, 4-chlorophenol, and 2,4-dichlorophenol) on these adsorbents is parallel to their porosity and surface area order. The uptake of the phenols on carbonaceous adsorbent is substantial and found to be 17.2, 50.3, 57.4, and 132.5 mg/g for phenol, 2-chlorophenol, 4-chlorophenol, and 2,4-dichlorophenol, respectively. The detailed adsorption studies on carbonaceous adsorbent have indicated that the adsorption process follows the Langmuir isotherm, is first order, and is pore diffusion controlled. As adsorption of phenols on prepared carbonaceous adsorbent is significant, its performance has been evaluated with respect to standard activated charcoal. The results indicate that the phenols removal efficiency of carbonaceous adsorbent is about 45% to that of a standard activated charcoal sample. Thus, the carbonaceous adsorbent can be used for the removal of phenols as a low-cost alternative (similar to0.1 U.S$/kg) to activated charcoal.

Keywords: Low-Cost Adsorbent, Activated Carbons, Chlorinated Phenols, Aqueous-Solutions, Agricultural Waste, Adsorption, Water, Oxidation, Kinetics, Wastewaters

Notes: highly cited

? Liu, H., Ramnarayanan, R. and Logan, B.E. (2004), Production of electricity during wastewater treatment using a single chamber microbial fuel cell. *Environmental Science & Technology*, **38** (7), 2281-2285.

Full Text: [2004\Env Sci Tec38, 2281.pdf](2004/Env%20Sci%20Tec38,%202281.pdf)

Abstract: Microbial fuel cells (MFCs) have been used to produce electricity from different compounds, including acetate, lactate, and glucose. We demonstrate here that it is also possible to produce electricity in a MFC from domestic wastewater, while at the same time accomplishing biological wastewater treatment (removal of chemical oxygen demand; COD). Tests were conducted using a single chamber microbial fuel cell (SCMFC) containing eight graphite electrodes (anodes) and a single air cathode. The system was operated under continuous flow conditions with primary clarifier effluent obtained from a local wastewater treatment plant. The prototype SCMFC reactor generated electrical power (maximum of 26 MW m(-2)) while removing up to 80% of the COD of the wastewater. Power output was proportional to the hydraulic retention time over a range of 3-33 h and to the influent wastewater strength over a range of 50-220 mg/L of COD. Current generation was controlled primarily by the efficiency of the cathode. Optimal cathode performance was obtained by allowing passive air flow rather than forced air flow (4.5-5.5 L/min). The Coulombic efficiency of the system, based on COD removal and current generation, was < 12% indicating a substantial fraction of the organic matter was lost without current generation. Bioreactors based on power generation in MFCs may represent a completely new approach to wastewater treatment. If power generation in these systems can be increased, MFC technology may provide a new method to offset wastewater treatment plant operating costs, making advanced wastewater treatment more affordable for both developing and industrialized nations.

Keywords: Metal-Reducing Bacterium, Geobacter-Sulfurreducens, Shewanella-Putrefaciens, Generation, Reduction, Fe(III), Glucose, Energy

Pandit, P. and Basu, S. (2004), Removal of ionic dyes from water by solvent extraction using reverse micelles. *Environmental Science & Technology*, **38** (8), 2435-2442.

Full Text: [E\Env Sci Tec38, 2435.pdf](E/Env%20Sci%20Tec38,%202435.pdf)

Abstract: Several methods (e.g., UV/H2O2 oxidation, adsorption, flocculation-precipitation) are normally employed to remove dye from water. A new technique based on liquid/liquid extraction using reverse micelles is proposed whereby recovery of solvent and reuse of dye is possible. Experiments were conducted by mixing a known quantity of dye in aqueous phase and solvent-containing surfactants in a simple mixer. The separation of solvent phase, containing encapsulated dye in reverse micelles, from aqueous phase due to gravity results in separation of dye from water. The removal of different ionic dyes (e.g., eosin yellow, Methylene blue, malachite green, methyl orange, orange G) from aqueous phase in the presence of different cationic and anionic surfactants [e.g., sodium dodecylbenzene sulfonate, sodium bis(2-ethylhexyl) sulfosuccinate, hexadecyltrimethylammonium bromide, and cetyl pyridinium chloride] in different solvents (e.g., amyl alcohol, benzyl alcohol, methyl benzoate, and isooctane) were studied by conducting experiments. The percentage removal of dye from aqueous phase increases with the decrease in dye concentration or with the increase in surfactants concentration. Furthermore, the percentage COD removal of dye is increased with the increase in surfactant concentration. The nature of solvent has minimal effect on percentage removal of dye. The ratio of solvent to aqueous phase volume required for the removal of dye decreases with the increase in surfactant concentration. It is possible to back-extract dye into aqueous phase and recover solvent by using counterionic surfactants. The separation of aqueous phase from the aqueous-phase solvent dispersion is faster for amyl alcohol as compared to benzyl alcohol and methyl benzoate. A theoretical model based on ion-exchange reaction between surfactants and dye is used to analyze the experimental data.

Keywords: Liquid-Liquid-Extraction, Waste-Water, Organic-Dyes, Amino-Acids, Equilibrium, Adsorbents, Recovery, Column

Ho, Y.S. (2004), Comment on “Arsenic removal using mesoporous alumina prepared via a templating method”. *Environmental Science & Technology*, **38** (11), 3214-3215.

Full Text: [E\Env Sci Tec38, 3214.pdf](E/Env%20Sci%20Tec38,%203214.pdf) [E\Env Sci Tec-Ho.pdf](E/Env%20Sci%20Tec-Ho.pdf)

Keywords: Fungus Aspergillus-Niger, Heavy-Metal Adsorption, Sugarcane Bagasse Pith, Activated Date Pits, Sphagnum Moss Peat, Aqueous-Solution, Kinetic-Models, Tree Fern, Sorption Kinetics, Dye Sorption

Kim, Y.H., Kim, C.M., Choi, I., Rengaraj, S. and Yi, J. (2004), Response to comment on “Arsenic removal using mesoporous alumina prepared via a templating method”. *Environmental Science & Technology*, **38** (11), 3216.

Full Text: [E\Env Sci Tec38, 3216.pdf](E/Env%20Sci%20Tec38,%203216.pdf)

Keywords: Sorption, Ions, Adsorption

Mezyk, S.P., Jones, J., Cooper, W.J., Tobien, T., Nickelsen, M.G., Adams, J.W., O’Shea, K.E., Bartels, D.M., Wishart, J.F., Tornatore, P.M., Newman, K.S., Gregoire, K. and Weidman, D.J. (2004), Radiation chemistry of methyl *tert*-butyl ether in aqueous solution. *Environmental Science & Technology*, **38** (14), 3994-40016.

Full Text: [E\Env Sci Tec38, 3994.pdf](E/Env%20Sci%20Tec38,%203994.pdf)

Abstract: The chemical kinetics of the free-radical-induced degradation of the gasoline oxygenate methyl tert-butyl ether (MTBE) in water have been investigated. Rate constants for the reaction of MTBE with the hydroxyl radical, hydrated electron, and hydrogen atom were determined in aqueous solution at room temperature, using electron pulse radiolysis and absorption spectroscopy ((OH)-O-. and e(aq)(-)) and EPR free induction decay attenuation (H-.) measurements. The rate constant for hydroxyl radical reaction of (1.71±0.02)×109 M-1 s-1 showed that the oxidative process was the dominant pathway, relative to MTBE reaction with hydrogen atoms, (3.49±0.06)×106 M-1 s-1, or hydrated electrons, <8.0×106 M-1 s-1. The hydroxyl radical reaction gives a transient Garbon-centered radical which subsequently reacts with dissolved oxygen to form peroxyl radicals, the rate constant for this reaction was (2.17±0.06)×109 M-1 s-1. The second-order decay of the MTBE peroxyl radical was 2k = (6.0±0.3)×108 M-1 s-1. These rate constants, along with preliminary MTBE degradation product distribution measurements, were incorporated into a kinetic model that compared the predicted MTBE removal from water against experimental measurements performed under large-scale electron beam treatment conditions.

Keywords: Radical-Induced Oxidation, Pulse-Radiolysis, Rate Constants, Ozone/Hydrogen Peroxide, Hydrated Electron, Hydroxyl Radicals, Organic-Compounds, Gamma-Radiolysis, Water-Treatment, Hydrogen-Atoms

? Gupta, V.K., Ali, I. and Saini, V.K. (2004), Removal of chlorophenols from wastewater using red mud: An aluminum industry waste. *Environmental Science & Technology*, **38** (14), 4012-4018.

Full Text: [2004\Env Sci Tec38, 4012.pdf](2004/Env%20Sci%20Tec38,%204012.pdf)

Abstract: Removal of toxic substances from wastewaters using low-cost alternatives to activated carbon is an important area in environmental sciences. Efforts have been made to convert red mud, an aluminum industry waste, into a low-cost potential adsorbent, and the final material has been used for the removal of phenol, 2-chlorophenol, 4-chlorophenol, and 2,4-dichlorophenol from wastewater. It is pertinent to mention that phenol and chlorophenols are highly carcinogenic and an priority class of pollutants which needs to be removed from effluents before discharge into water bodies. 2,4-Dichlorophenol and 4-chlorophenol are sorbed by the developed adsorbent up to 94-97%, while the removal of 2-chlorophenol and phenol was up to 50-81%. The removal of phenols and its derivatives was achieved up to 98% by column experiments at a flow rate of 0.5 mL/min. The order of removal was 2,4-dichlorophenol > 4-chlorophenol > 2-chlorophenol > phenol, and the removal takes place through a particle diffusion mechanism. The adsorption was found to be endothermic in nature and follows both Langmuir and Freundlich models. Estimation of the phenols was carried out by capillary electrophoresis, and the adsorbent has been successfully tried for the removal of chlorophenols from a wastewater. The developed process is very useful, economic, rapid, and reproducible for the removal of phenols.

Vincent, T. and Guibal, E. (2004), Chitosan-supported palladium catalyst. 5. Nitrophenol degradation using palladium supported on hollow chitosan fibers. *Environmental Science & Technology*, **38** (15), 4233-4240.

Full Text: [E\Env Sci Tec38, 4233.pdf](E/Env%20Sci%20Tec38,%204233.pdf)

Abstract: Hollow chitosan fibers were reacted with chloro-palladate solutions and subsequently reduced by hydrogen produced in situ by reaction of sulfuric acid with zinc powder in order to manufacture palladium supported on catalytic hollow chitosan fibers ((CHF)-H-2-Pd). This catalytic support was used to degrade 3-nitrophenol (3-NP) using two different hydrogen donors (hydrogen gas and sodium formate). The solution was flowed through the lumen of the fiber, while the sodium formate was recirculated round the outside of the fiber. In the case of hydrogen gas, the gas was maintained under controlled pressure outside the fiber. The influence of the pH, residence time (ca. flow velocity), nitrophenol concentration, and hydrogen-donor concentration (or pressure) was investigated for both systems in order to evaluate the limiting parameters. While the system using sodium formate was the most efficient for nitrophenol conversion, the system using hydrogen gas avoided the production of secondary waste solutions (formate solutions with traces of nitrophenol, which pass through the fiber membrane).

Keywords: 4-Nitrophenol, Adsorption, Aromatic Nitro-Compounds, Chiral Stationary Phases, Hydrogenation, Kinetics, Metal-Ions, Oxidation, P-Nitrophenol, Slurry Reactor

? Park, D., Yun, Y.S. and Park, J.M. (2004), Reduction of hexavalent chromium with the brown seaweed *Ecklonia* biomass. *Environmental Science & Technology*, **38** (18), 4860-4864.

Full Text: [2004\Env Sci Tec38, 4860.pdf](2004/Env%20Sci%20Tec38,%204860.pdf)

Abstract: A new type of biomass, protonated brown seaweed Ecklonia sp., was used for the removal of Cr(VI). When synthetic wastewater containing Cr(VI)was placed in contact with the biomass, the Cr(VI) was completely reduced to Cr(III). The converted Cr(III) appeared in the solution phase or was partly bound to the biomass. The Cr(VI) removal efficiency was always 100% in the pH range of this study (pH 1 similar to 5). Furthermore, the Cr(VI) reduction was independent of the Cr(III) concentration, the reaction product, suggesting that the reaction was an irreversible process under our conditions. Proton ions were consumed in the ratio of 1.15 ± 0.02 mol of protons/mol of Cr(VI), and the rate of Cr(VI) reduction increased with decreasing the pH. An optimum pH existed for the removal efficiency of total chromium (Cr(VI) plus Cr(III)), but this increased with contact time, eventually reaching approximately pH 4 when the reaction was complete. The electrons required for the Cr(VI) reduction also caused the oxidation of the organic compounds in the biomass. One gram of the biomass could reduce 4.49 ± 0.12 mmol of Cr(VI). From a practical viewpoint, the abundant and inexpensive Ecklonia biomass could be used for the conversion of toxic Cr(VI) into less toxic or nontoxic Cr(III).

Keywords: Heavy-Metal Biosorption, Aqueous-Solutions, Rhizopus-Arrhizus, Marine-Algae, Removal, Cr(VI), Adsorption, Chromate, Sawdust, Water

? Wigton, A. and Kilduff, J.E. (2004), Modeling trichloroethylene adsorption by activated carbon preloaded with natural dissolved organic matter using a modified IAST approach. *Environmental Science & Technology*, **38** (22), 5825-5833.

Full Text: [2004\Env Sci Tec38, 5825.pdf](2004/Env%20Sci%20Tec38,%205825.pdf)

Abstract: A model was developed, using an approach based on the Ideal Adsorbed Solution Theory (IAST), to predict trichloroethylene (TCE) adsorption by granular activated carbon (GAC) preloaded with natural dissolved organic matter (DOM) isolated from three surface water sources. The IAST model was formulated for a bi-solute system in which TCE and DOM single-solute uptakes were described by the Langmuir-Freundlich and Freundlich isotherms, respectively. The effect of DOM molecular size and polarity (as measured by XAD 8 resin fractionation) on TCE uptake by preloaded GAC was assessed to identify a reactive fraction of natural water DOM for the purpose of modeling competitive adsorption. Consistent with previous work that identified low molecular weight species as the most reactive with regard to preloading effects (i.e., reducing target compound uptake), the low molecular weight components of the polar (hydrophilic) and nonpolar (hydrophobic) DOM fractions, isolated using ultrafiltration (1 kDa molecular weight cutoff membrane), exhibited significant competitive effects. Furthermore, the effects of these fractions on TCE uptake were similar; therefore, they were considered together to represent a single “reactive fraction” of DOM. On the basis of this finding, isotherms for the <1 kDa low molecular weight DOM fraction of the whole water were measured, and molar concentrations were computed based on an average molecular weight determined using size-exclusion chromatography. The IAST model was modified to incorporate surface area reduction due to pore blockage by DOM and to reflect the hypothesis that TCE molecules can access adsorption sites which humic molecules cannot, thus preventing competition on these sites. The model was calibrated with data for TCE uptake by carbon preloaded with the <1 kDa low molecular weight DOM fraction and was verified by predicting TCE uptake by carbon preloaded with whole natural waters for both constant GAC dose (hence constant DOM loading) and variable GAC dose (hence variable DOM loading) TCE isotherms. Preloading by DOM reduced volume in GAC pores having widths smaller than 1.25 nm (likely accessible only to TCE) to a greater extent than total pore volume, suggesting preferential blockage of micropores. Such preferential pore blockage may explain, in part, why increased DOM loading decreases the fraction of the total surface area on which no competition between TCE and DOM occurs.

Keywords: Access, Activated Carbon, Adsorption, Aquatic Humic Substances, Carbon, Chromatography, Competition, Competitive Adsorption, Dissolved, Dissolved Organic Matter, DOM, Equilibrium Adsorption, Fractionation, Fractions, GAC, Humic, Isotherms, Loading, Matter, Membrane, Model, Modeling, Molecular-Weight, Natural, Natural Water, Natural Waters, Organic, Organic Matter, Pore Volume, Pore-Size, Predict, Predicting, Preparative Isolation, Reduction, Sites, Size Exclusion Chromatography, Size-Exclusion, Sources, Surface Area, Surface Water, TCE, TCE Adsorption, Ultrafiltration, Uptake, Water

? Ochola, C.E. and Moo-Young, H.K. (2004), Establishing and elucidating reduction as the removal mechanism of Cr(VI) by reclaimed limestone residual RLR (Modified Steel Slag). *Environmental Science & Technology*, **38** (22), 6161-6165.

Full Text: [2004\Env Sci Tec38, 6161.pdf](2004/Env%20Sci%20Tec38,%206161.pdf)

Abstract: The viability of utilizing Reclaimed Limestone Residual RLR (Modified Steel Slag) to remove hexavalent chromium Cr(VI) from the aqueous phase was investigated. A physical characterization of RLR showed that it is composed of various minerals some of which can reduce and others adsorb Cr(VI). Preliminary results showed that RLR significantly reduced the concentration of Cr(VI) from the aqueous phase. Adsorption competition tests with orthophosphate (HPO42-) and sulfate (SO42-) showed that COO was still effectively reduced from solution regardless of the competing anions present. Kinetic tests based on the relationship d[Cr(VI)]/dt = k(cr)[RLR](alpha)[Cr(VI)](beta) showed that under initially neutral to basic conditions k(cr) = 3.45 +/- 1 (0.25) x 10(-4) Mg-0.4 L-0.4 h(-1), alpha = 0.9, and beta = -0.3, while under initially acidic conditions k(cr) = 5.65 (1.055) x 10(-11) mg(-0.4) L-0.4 h(-1), alpha = 2.2, and beta = -0.8. Stirred batch tests with RLR in deionized water showed significant drops in the redox potential (Eh), and in the presence of oxygen Eh values dropped to between 50 and 100 mV while in the absence of oxygen Eh values as low as -200 mV were observed. These results lead to the conclusion that redox mechanisms were responsible for the reduction of hexavalent chromium by RLR.

Keywords: 25-Degrees-C, Adsorption, Chromate Reduction, Chromium, Cr(VI), Dissolution Kinetics, Ferrous Iron, Hexavalent Chromium, Hydroxides, Kinetic, Lead, Mechanism, Minerals, Silicate Dissolution, Soils, Temperature, Viability

Shtepenko, O.L., Hills, C.D., Coleman, N.J. and Brough, A. (2005), Characterization and preliminary assessment of a sorbent produced by accelerated mineral carbonation. *Environmental Science & Technology*, **39** (1), 345-354.

Full Text: [E\Env Sci Tec39, 345.pdf](E/Env%20Sci%20Tec39,%20345.pdf)

Abstract: This study shows that calcium silicate/aluminate-based materials can be carbonated to produce sorbents for metal removal. The material chosen for investigation, cement clinker, was accelerated carbonated, and its structural properties were investigated using X-ray diffraction (XRD), scanning electron microscopy, thermal gravimetric and differential thermal analysis, nuclear magnetic resonance spectroscopy, and nitrogen gas adsorption techniques. The principal carbonation reactions involved the transformation of dicalcium silicate, tricalcium silicate, and tricalcium aluminate into a Ca/Al-modified amorphous silica and calcium carbonate. It was found that carbonated cement had high acid buffering capacity, and maintained its structural integrity within a wide pH range. The uptake of Pb(II), Cd(II), Zn(II), Ni(II), Cr(III), Sr(II), Mo(VI), Cs(I), Co(II), and Cu(II) from concentrated (1000 mg L<sup>-1</sup>) single-metal solutions varied from 35 to 170 mg g<sup>-1</sup> of the carbonate cement. The removal of metals was hardly effected by the initial solution pH due to the buffering capability of the carbonated material. The kinetics of Pb, Cd, Cr, Sr, Cs, and Co removal followed a pseudo-second-order kinetic model, whereas the equilibrium batch data for Cu fitted the pseudo-first-order rate equation. PHREEQC simulation supported by XRD analysis suggested the formation of metal carbonates and silicates, calcium molybdate, and chromium (hydro)-oxide. Cesium was likely to be adsorbed by Ca/Al-modified amorphous silica.

? Serpa, A.L., Schneider, I.A.H. and Rubio, J. (2005), Adsorption onto fluidized powdered activated carbon flocs-PACF. *Environmental Science & Technology*, **39** (3), 885-888.

Full Text: [2005\Env Sci Tec39, 885.pdf](2005/Env%20Sci%20Tec39,%20885.pdf)

Abstract: This work presents a new adsorption technique where the adsorbent (powdered activated carbon-PAC) is in the form of suspended flocs formed with water-soluble polymer flocculants. Thus, the adsorption of a typical dye, methylene blue (MB), was studied onto polyacrylamide flocs of PAC (PACF) in a fluidized bed reactor. The technique is based on the fact that the adsorption capacity of PAC does not decrease after flocculation because the adsorbed polymer occupies only a few surface sites, in the form of trains, loops, and tails. Moreover, the adsorption was found to proceed through a rapid mass transfer of MB to the adsorbing PAC flocs, in the same extent as onto PAC. Because of the rapid settling characteristics of the aggregates formed, the two phase separations, loaded PAC and solution, become easier. Thus, the technique offers the advantages of conducting simultaneously both adsorption and solid/liquid separation all in one single stage. Results obtained showed that high MB removal values can be attained in a fluidized bed reactor (>90%) and that PACF presents a much higher adsorption capacity (breakthrough points) than granulated activated carbon (GAC) in the same adsorbing bed. It is believed that this technique highly broadens the potential of the use of powdered activated carbon or other similar ultrafine adsorbents.

Keywords: Aqueous-Solutions, Blanket Reactors, Removal, Adsorbents, Dyestuffs, Atrazine, Dyes, Bed

? Kanel, S.R., Manning, B., Charlet, L. and Choi, H. (2005), Removal of arsenic(III) from groundwater by nanoscale zero-valent iron. *Environmental Science & Technology*, **39** (5), 1291-1298.

Full Text: [2005\Env Sci Tec39, 1291.pdf](2005/Env%20Sci%20Tec39,%201291.pdf)

Abstract: Nanoscale zero-valent iron (NZVI) was synthesized and tested for the removal of As(Ill), which is a highly toxic, mobile, and predominant arsenic species in anoxic groundwater. We used SEM-EDX, AFM, and XRD to characterize particle size, surface morphology, and corrosion layers formed on pristine NZVI and As(Ill)-treated NZVI. AFM results showed that particle size ranged from 1 to 120 nm. XRD and SEM results revealed that NZVI gradually converted to magnetite/maghemite corrosion products mixed with lepidocrocite over 60 d. Arsenic(III) adsorption kinetics were rapid and occurred on a scale of minutes following a pseudo-first-order rate expression with observed reaction rate constants (k(obs) of 0.07-1.3 min-1 (at varied NZVI concentration). These values are about 1000x higher than k(obs), literature values for As(III) adsorption on micron size ZVI. Batch experiments were performed to determine the feasibility of NZVI as an adsorbent for As(III) treatment in groundwater as affected by initial As(III) concentration and pH (pH 3-12). The maximum As(III) adsorption capacity in batch experiments calculated by Freundlich adsorption isotherm was 3.5 mg of As(III)/g of NZVI. Laser light scattering (electrophoretic mobility measurement) confirmed NZVI-As(III) inner-sphere surface complexation. The effects of competing anions showed HCO3, H4SiO40, and H2PO42- are potential interferences in the As(III) adsorption reaction. Our results suggest that NZVI is a suitable candidate for both in-situ and ex-situ groundwater treatment due to its high reactivity.

Keywords: Adsorbent, Adsorption, Adsorption Capacity, Adsorption Isotherm, Adsorption Kinetics, AFM, Anions, Anoxic, Aqueous-Solution, Arsenate Removal, Arsenic, Arsenite Removal, As(III), Batch Experiments, Capacity, Catalyzed Oxidation, Complexation, Concentration, Corrosion, Effects, Ferrihydrite, Freundlich, Groundwater, Hydrogen-Peroxide, In Situ, Iron, Isotherm, Kinetics, Light, Light Scattering, Measurement, Mobility, Morphology, Natural-Waters, Particle, Particle Size, pH, Products, Reaction, Reaction Rate, Reactivity, Remediation, Removal, Scale, SEM, SEM-EDX, Surface, Surface Complexation, Surface Morphology, Surface-Chemistry, Toxic, Treatment, XRD, Zero-Valent Iron, Zerovalent Iron

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Full Text: [E\Env Sci Tec39, 1324.pdf](E/Env%20Sci%20Tec39,%201324.pdf)

Abstract: Surfactant templated synthesis of mesoporous ceramics provides a versatile foundation upon which to create high efficiency environmental sorbents. These nanoporous ceramic oxides condense a huge amount of surface area into a very small volume. The ceramic oxide interface is receptive to surface functionalization through molecular selfassembly. The marriage of mesoporous ceramics with selfassembled monolayer chemistry creates a powerful new class of environmental sorbent materials called selfassembled monolayers on mesoporous supports (SAMMS). These SAMMS materials are highly efficient sorbents whose interfacial chemistry can be fine-tuned to selectively sequester a specific target species, such as heavy metals, tetrahedral oxometalate anions, and radionuclides. Details addressing the design, synthesis, and characterization of SAMMS materials specifically designed to sequester actinides, of central importance to the environmental cleanup necessary after 40 years of weapons-grade plutonium production, as well as evaluation of their binding affinities and kinetics are presented.

Keywords: Molecular-Sieves, N-Alkylphenothiazines, Functionalized Monolayers, Polyoxometalate Clusters, Microporous Materials, Interfacial Reactions, Sequestering Agents, Co-Condensation, Metal-Ions, Silica

? Powell, B.A., Fjeld, R.A., Kaplan, D.I., Coates, J.T. and Serkiz, S.M. (2005), PU(V)O2+ adsorption and reduction by synthetic hematite and goethite. *Environmental Science & Technology*, **39** (7), 2107-2114.

Full Text: [E\Env Sci Tec39, 2107.pdf](E/Env%20Sci%20Tec39,%202107.pdf)

Abstract: Changes in aqueous- and solid-phase plutonium oxidation state were monitored over time in hematite (alpha-Fe2O3) and goethite (alpha-FeOOH) suspensions containing (PU)-P-239(V)-amended 0.01 M NaCl. Solid-phase oxidation state distribution was quantified by leaching plutonium into the aqueous phase and applying an ultrafiltration/solvent extraction technique. The technique was verified using oxidation state analogues of plutonium and sediment-free controls of known Pu oxidation state, Batch kinetic experiments were conducted at hematite and goethite concentrations between 10 and 500 m2 L-1 in the pH range of 3-8. Surface-mediated reduction of Pu(V) was observed for both minerals at pH values of 4.5 and greater. At pH 3 no adsorption of Pu(V) was observed on either goethite or hematite, consequently, no reduction was observed. For hematite, adsorption of Pu (V) was the rate-limiting step in the adsorption/reduction process. In the pH range of 5-8, the overall removal of Pu(V) from the system (solid and aqueous phases) was found to be approximately second order with respect to hematite concentration and of order -0.39 with respect to the hydrogen ion concentration. The overall reaction rate constant (k(rxn)), including both adsorption and reduction of Pu(V), was 1.75±2.05×10-10 (m-2 L)(-2.08) (mol-1 L)(-0.39) (s-1). In contrast to hematite, Pu(V) adsorption to goethite occurred rapidly relative to reduction. At a given pH,the reduction rate was approximately independent of the goethite concentration, although the hydrogen ion concentration (pH) had only a slight effect on the overall reaction rate. For goethite, the overall reaction rates at pH 5 and pH 8 were 6.0×10-5 and 1.5×10-1 s-1, respectively. For hematite, the reaction rate increased by 3 orders of magnitude across the same pH range.

Keywords: Different Oxidation-States, Natural-Waters, Plutonium, Solubility, Speciation, Chemistry, Seawater, Oxide, Pu, Environment

? Fathima, N.N., Aravindhan, R., Rao, J.R. and Nair, B.U. (2005), Solid waste removes toxic liquid waste: Adsorption of chromium(VI) by iron complexed protein waste. *Environmental Science & Technology*, **39** (8), 2804-2810.

Full Text: [E\Env Sci Tec39, 2804.pdf](E/Env%20Sci%20Tec39,%202804.pdf)

Abstract: The leather processing industry generates huge amounts of wastes, both in solid and liquid form. Fleshing from animal hides/skins is one such waste that is high in protein content. In this study, raw fleshing has been complexed with iron and is used for removal of chromium(VI). The effect of pH and the initial concentration of chromium(VI) on the removal of Cr(IV) by iron treated fleshing is presented. Iron treatment is shown to greatly improve adsorption of the fleshing for hexavalent chromium. The ultimate adsorption capacity of iron treated fleshing is 51 mg of chromium(VI) per gram of fleshing. That of untreated fleshing is 9 mg/g such that iron treatment increases the adsorption capacity of fleshing by 10-fold. The measured adsorption kinetics is well described by a pseudo-second-order kinetic model. The uptake of chromium(VI) by fleshing is best described by the Langmuir adsorption isotherm model. X-ray photoelectron spectroscopic (XPS) studies show that the iron is incorporated into the protein matrix. Shifts in XPS spectra suggest that dichromate binding occurs with iron at active adsorption sites and that iron treated fleshing removes chromium(VI) without reducing it to chromium(III)**.**

Keywords: Hexavalent Chromium, Heavy-Metals, Biosorption, Biosorbent, Trivalent, Chitosan

? Vaghela, S.S., Jethva, A.D., Mehta, B.B., Dave, S.P., Adimurthy, S. and Ramachandraiah, G. (2005), Laboratory studies of electrochemical treatment of industrial azo dye effluent. *Environmental Science & Technology*, **39** (8), 2848-2855.

Full Text: [E\Env Sci Tec39, 2848.pdf](E/Env%20Sci%20Tec39,%202848.pdf)

Abstract: Removal of color and reduction of chemical oxygen demand (COD) in an industrial azo dye effluent containing chiefly reactive dyes were investigated under single-pass conditions at a dimensionally stable anode (DSA) in a thin electrochemical flow reactor at different current densities, flow rates, and dilutions. With 50% diluted effluent, decolorization was achieved up to 85-99% at 10-40 mA/cm2 at 5 mL/min flow rate and 50-88% at 30-40 mA/cm2 at high (10-15 mL/min) flow rates. The COD reduction wasmaximum (81%) at 39.9 mA/cm2 or above when solution-electrode contact time (C-t) was as high as 21.7 s/cm2 and decreased as C-t declined at a given current density. Cyclic voltammetric studies suggesting an indirect oxidation of dye molecules over the anode surface were carried out at a glassy carbon electrode. The effect of pH on decolorization and COD reduction was determined. An electrochemical mechanism mediated by OCl- operating in the decolorization and COD reduction processes was suggested. The effluent was further treated with NaOCl. The oxidized products from the treated effluents were isolated and confirmed to be free from chlorine-substituted products by IR spectroscopy. From the apparent pseudo-first-order rate data, the second-order rate coefficients were evaluated to be 2.9 M-1 s-1 at 5 mL/min, 76.2 M-1 s-1 at 10 mL/min, and 156.1 M-1 s-1 at 15 mL/min min for color removal, and 1.19 M-1 s-1 at 5 mL/min, 1.79 M-1 s-1 at 10 mL/min, and 3.57 M-1 s-1 at 15 mL/min for COD reduction. Field studies were also carried out with a pilot-scale cell at the source of effluent generation of different plants corresponding to the industry. Decolorization was achieved to about 94-99% with azo dye effluents at 0.7-1.0 L/min flow costing around Indian Rupees 0.02-0.04 per liter, and to about 54-75% in other related effluents at 0.3-1.0 L/min flow under single-pass conditions.

Keywords: Textile Waste-Water, Disperse Dyes, Decolorization, Oxidation, Degradation, Hypochlorite, Wastewaters, Adsorption, Ozonation, Color

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Full Text: [E\Env Sci Tec39, 4249.pdf](E/Env%20Sci%20Tec39,%204249.pdf)

Abstract: Sewage sludges produced from wastewater treatment plants continue to set environmental problems in terms of volume and way of reuse. Thermal treatment of sewage sludge is considered as an attractive method in reducing sludge volume, and at the same time, it produces reusable byproducts. This paper deals with porous carbonaceous materials production from sewage sludge by pyrolysis (or carbonization) process with a goal of different industrial applications. Carbonization experiments were carried out on two kinds of sludge, namely viscous liquid sludge and limed sludge by varying carbonization temperature between 400°C to 1000°C. The porous structure and surface chemistry of the materials obtained were characterized using nitrogen adsorption, scanning electron microscopy, elemental analysis, Boehm titration, and pH of zero point of charge determination. The results show that basic character of the carbonized residues increases with increasing carbonization temperature. Then, carbonization allows specific surface area and pore volumes to be developed. Carbonized viscous liquid sludge and carbonized limed sludge are mainly mesoporous in nature, with specific surface areas reaching about 100 m2 g-1 and 60 m2 g-1, respectively. Finally, adsorption experiments, in aqueous solution, were carried out and show that carbonized viscous liquid sludges and limed sludge remove effectively the metallic ion Cu2+, acid and basic dyes, and phenol. Pyrolyzed sludges properties seem to be encouraging for the preparation of activated carbon by physical activation process.

Keywords: Activated Carbons, Functional-Groups, Adsorbents, Gases

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Full Text: [E\Env Sci Tec39, 4280.pdf](E/Env%20Sci%20Tec39,%204280.pdf)

Abstract: Drinking-water treatment residuals (WTRs) are nonhazardous materials that can be obtained free-of-charge from drinking-water treatment plants to reduce soluble phosphorus (P) concentrations in poorly P sorbing soils. Phosphorus sorption capacities of WTRs can vary 1-2 orders of magnitude, on the basis of short-term equilibration times (up to 7 d), but studies dealing with long-term (weeks to months) P retention by WTRs are lacking. Properties that most affect long-term P sorption capacities are pertinent to the efficacy of WTRs as amendments to stabilize P in soils. This research addressed the long-term (up to 80 d) P sorption/desorption characteristics and kinetics for seven WTRs, including the influence of specific surface area (SSA), porosity, and total C content on the overall magnitude of P sorption by seven WTRs. The data confirm a strong but variable affinity for P by WTRs. Aluminum-based WTRs tended to have higher P sorption capacity than Fe-based WTRs. Phosphorus sorption with time was biphasic in nature for most samples and best fit to a second-order rate model. The P sorption rate dependency was strongly correlated with a hysteretic P desorption, consistent with kinetic limitations on P desorption from micropores. Oxalate-extractable Al + Fe concentrations of the WTRs did not effectively explain long-term (80 d) P sorption capacities of the WTRs. Micropore (CO2-based) SSAs were greater than BET-N2 SSAs for most WTRs, except those with the lowest (< 80 g kg-1) total C content. There was a significant negative linear correlation between the total C content and the CO2/N2 SSA ratio. The data suggest that C in WTRs increases microporosity, but reduces P sorption per unit pore volume or surface area. Hence, variability in C content confounds direct relations among SSA, porosity, and P sorption. Total C, N2-based SSA, and CO2-based SSAs explained 82% of the variability in the long-term P sorption capacities of the WTRs. Prediction of long-term P sorption capacities for different WTRs may be achieved by taking into account the three proposed variables.

Keywords: Soil Organic-Matter, Phosphate, Adsorption, Sorption, Desorption, Micropores, Mechanisms, Diffusion, Biosolids, Runoff

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Full Text: [E\Env Sci Tec39, 4628.pdf](E/Env%20Sci%20Tec39,%204628.pdf)

Abstract: A novel adsorbent, zirconium(IV)-impregnated Collagen fiber,was prepared. Zr(IV) was uniformly dispersed in Collagen fiber, mainly through chemical bonds, and was able to withstand the extraction of water. This adsorbent is effective for the removal of fluoride from aqueous solutions. The adsorption capacity was 2.29 mmol/g at pH = 5.5 when 5.00 mmol/L fluoride solution was adsorbed by use of 0.100 g of adsorbent, and the extent of removal was 97.4% when the adsorbent dose was 0.300 g. The adsorption isotherms were well fitted by the Langmuir equation, and the maximum adsorption capacities calculated by the Langmuir equation were close to those determined by experiment. The adsorption capacity increased with rising temperature. These facts imply that the mechanism of chemical adsorption might be involved in the adsorption process of fluoride on the absorbent and that fluorides are adsorbed in the form of monolayer coverage on the surface of the adsorbent. The adsorption kinetics of fluoride onto Zr(IV)-impregnated collagen fiber could be described by Lagergren’s pseudo-first-order rate mode. The investigation on desorption indicated that this adsorbent is easily regenerated by use of dilute NaOH solution.

Keywords: Aqueous-Solution, Waste-Water, Removal, Ion, Behavior, Carbon, Resins

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Full Text: [E\Env Sci Tec39, 5076.pdf](E/Env%20Sci%20Tec39,%205076.pdf)

Abstract: In the present study the ability of activated carbons developed from coconut shell fibers to remove (x-picoline, P-picoline, and gamma-picoline from aqueous solution in the broad range of concentrations (1-100 mg/L) is investigated. The derived carbons are designated as FAC (activated carbon derived from Coconut shell fibers without any treatment) and ATFAC (activated carbon derived from acid treated coconut shell fibers). Systematic equilibrium and kinetic adsorption studies at different pH, temperatures, particle size, and solid-to-liquid ratio were carried out to determine various parameters necessary to establish the fixed bed reactors.The Langmuir and Freundlich models were applied and the data are not fitted well by the Freundlich and Langmuir equations, but the Langmuir model has an edge over Freundlich model. The monolayer adsorption capacity (Q(0)) as calculated using Langmuir adsorption isotherm of the activated carbons viz., FAC and ATFAC is found to increase with an increase in temperature confirming the endothermic process. The ATFAC has a higher sorption capacity than FAC. Overall the adsorption of (alpha-picoline, beta-picoline, and gamma-picoline on FAC and ATFAC follow the order FAC(alpha-picoline) < ATFAC(alpha-picoline) < FAC(gamma-picoline) < ATFAC(beta-picoline)< FAC(beta-picoline) < ATFAC(gamma-picoline). The adsorption of(alpha- beta-,,,and -gamma-picoline followed the pseudosecond-order rate kinetics. On the basis of these studies various parameters such as effective diffusion coefficients, activation energy, and entropy of activation were evaluated to establish the mechanisms. It was concluded that the adsorption occurred through particle diffusion at low temperatures viz., 10°C and 25°C (except (alpha-picoline where it was film diffusion), while at 40°C it occurred through film diffusion. Similarly at concentrations of 25 and 50 mg/L the adsorption was particle diffusion controlled (except for a-picoline where it was film diffusion), while at > 50 mg/L it was film diffusion controlled.

Keywords: Acid, Activated Carbon, Activated Carbons, Activation, Activation Energy, Adsorption, Adsorption Capacity, Adsorption Isotherm, Agricultural Waste, Alpha-Picoline, Aqueous Solution, Beta-Picoline, Biodegradation, Capacity, Carbon, Coconut Shell, Concentrations, Cost, Diffusion, Diffusion Coefficients, Dilute Aqueous-Solution, Effective, Endothermic, Energy, Entropy, Equations, Equilibrium, Fibers, Film, Film Diffusion, Fixed Bed, Fixed-Bed, Fly-Ash, Freundlich, Freundlich Model, Immobilized Pimelobacter sp, Isotherm, Kinetic, Kinetic Adsorption, Kinetics, Langmuir, Langmuir Adsorption, Langmuir Adsorption Isotherm, Langmuir Equations, Langmuir Model, Low, Mechanisms, Model, Models, Monolayer, Montmorillonite, Order, Parameters, Particle, Particle Diffusion, Particle Size, pH, Process, Pyridine-Derivatives, Range, Rundle Spent Shale, Shell, Sorption, Sorption Capacity, Synthetic, Synthetic Wastewater, Temperature, Temperatures, Treatment, Wastewater

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Full Text: [2005\Env Sci Tec39, 6117.pdf](2005/Env%20Sci%20Tec39,%206117.pdf)

Abstract: The influence of interaction between mineral components in natural mixtures on the adsorption of organic and inorganic species on the mineral surfaces is recognized. However, the surface phenomena have been meagerly investigated. In this study the formation of different surface species of surfactant (amyl xanthate, C5H11OC(S)S-) adsorbed on FeS2, PbS, and CuFeS2 has been spectroscopically investigated in single-mineral and complex systems. The type and amount of adsorbed species were determined directly on each mineral surface by infrared external reflection spectroscopy. Galvanic interaction between grains of different minerals could have tremendous consequence on the adsorption of surfactants on each mineral component and their future reactivity. The detected changes are dramatic, from no adsorption to the formation of several layers of hydrophobic or hydrophilic surface products depending on which minerals are in contact. It has been documented that even very short contact time between different mineral grains by collision is sufficient to produce dramatic modification of the surface composition and structure. The results obtained indicate clearly that the observations and conclusions about the surfactant adsorption made in a single mineral system cannot be simply extrapolated to describe the real situation in natural multicomponent mineral systems. The obtained information on sulfide mineral interaction in complex systems is indispensable to understand processes taking place in nature at mineral-water interfaces (dissolution of heavy metals). An additional benefit is the improved ability to design efficient separation processes of these minerals.

Keywords: Absorption, Adsorption, Benefit, Complex, Composition, Design, Dissolution, External Reflection, Flotation, Fluorite, Heavy Metals, Information, Inorganic, Interaction, Interfaces, Layers, Made, Metals, Mineral, Modification, Molecular-Orientation, Monolayers, Natural, Oleate, Organic, Products, Reactivity, Region, Separation, Simulation, Spectroscopy, Structure, Sulfide, Surface Modification, Surfaces, Surfactant, Surfactants

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Full Text: [2005\Env Sci Tec39, 6138.pdf](2005/Env%20Sci%20Tec39,%206138.pdf)

Abstract: In both forest and agricultural soils, plant derived cuticular materials can constitute a significant part of soil organic matter. In this study, the sorption of nonpolar (naphthalene and phenanthrene) and polar (phenol and 1-naphthol) aromatic organic pollutants to aliphatic-rich cuticular fractions of green pepper (Capsicum annuum) (i.e., bulk (PC1), dewaxed (PC2), nonsaponifiable (PC3), nonsaponifiable-nonhydrolyzable (PC4), and dewaxed-hydrolyzed residue (PC5)) were examined to better understand the influence of polarity and accessibility on their sorption behavior. The polarity and structures of cuticular fractions were characterized by elemental analysis, Fourier transform infrared spectroscopy, and solid-state C-13 NMR. The sorption isotherms fit well to the Freundlich equation. Sorption of the tested organic compounds to PC4, which had more condensed domains, was nonlinear (Freundlich N-s values of 0.766-0.966). For naphthalene and phenanthrene, the largest sorption capacity (K-OC) occurred in PC5, which contained the highest paraffinic carbons (63%) and the lowest polarity: similar to 2 and similar to 3 times higher than the respective carbon-normalized octanol-water partition coefficient (K-OWC), indicating that PC5 was a powerful sorption medium. For phenol and 1-naphthol, the largest K-OC values occurred in PC4 with polar aromatic cores: similar to 17 and similar to 7 times higher than the respective Kc, suggesting that PC4 was much more accessible and compatible to polar aromatic pollutants than nonpolar aromatic pollutants. There was little or no correlation of K-OC with either aliphatic or aromatic components of the tested aliphatic-rich sorbents because the polarity and accessibility apparently played a regulating role in the sorption of organic contaminants.

Keywords: C-13 NMR, Distributed Reactivity Model, Equilibria, Forest Soil, Matter, Modified Humic Acids, Nuclear-Magnetic-Resonance, Phenanthrene Sorption, Sediments, Substances

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Full Text: [2005\Env Sci Tec39, 6273.pdf](2005/Env%20Sci%20Tec39,%206273.pdf)

Abstract: Inorganic/organic hybrid adsorbents for removing orthophosphate from water were prepared by lanthanum (La) treatment of bark fiber, a lignocellulosic material obtained from juniper (Juniperus monosperma). The La was anchored to the juniper bark (JB) fiber by ion exchange with Ca in the bark and was responsible for removing orthophosphate. Two La concentrations (0.01 and 0.1 M) were used that resulted in loadings of 0.198 (La/JB01) and 0.302 (La/JB02) mmol of La g-1 of fiber, respectively. At circumneutral pH conditions, La exhibited a strong affinity for bark, but significant La desorption occurred under acidic conditions (pH < 4.5). For La/JB02, 86% of the initial La loading was released at PH 2.5, and only 0.1% at PH 7.3. Initial La loading in the bark fiber significantly influenced its orthophosphate sorption capacity, which was determined for La/JB01 and La/JB02, respectively, to be 0.188 and 0.233 mmol of P g-1 (sorption envelopes) and 0.211 and 0.351 mmol of P g-1 (sorption isotherms when surface site saturation occurred). The P-to-La molar ratio on the bark surface was extremely high (0.12-1.77 for La/JB01 and 0.13-2.58 for La/JB02), implying that orthophosphate removal occurred by other mechanisms in addition to surface complexation. From the orthophosphate surface loading levels and the shape of the sorption isotherms, it appears that adsorption occurred at low sorbate-to-sorbent (P-to-La-treated JB) ratios and transitioned to surface precipitation at higher ratios. When surface precipitation occurred, orthophosphate uptake continued to increase with increasing initial P levels. Results from X-ray diffraction and infrared spectrometric analyses are also suggestive of the occurrence of surface precipitation during the interaction of orthophosphate with La-treated lignocellulosic materials.

Keywords: Arsenate Adsorption, Aqueous-Solutions, Metal-Ions, Removal, Iron, Phosphate, Kinetics, Oxides, Water, Precipitation

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Full Text: [2005\Env Sci Tec39, 362A.pdf](2005/Env%20Sci%20Tec39,%20362A.pdf)

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Full Text: [2005\Env Sci Tec39, 6808.pdf](2005/Env%20Sci%20Tec39,%206808.pdf)

Abstract: A new adsorbent, bead cellulose loaded with iron oxyhydroxide (BCF), was prepared and applied for the adsorption and removal of arsenate and arsenite from aqueous systems. The continuing loading process of Fe in the cellulose beads was realized through hydrolization of ferric salts when alkaline solution was added dropwise. Spherical BCF had excellent mechanical and hydraulic properties. Akaganeite (beta-FeOOH), the reactive center of BCF that was stably loaded into the cellulose, had a high sensitivity to arsenite as well as arsenate. The maximum content of Fe in BCF reached 50% (w/w). In this study we investigated the adsorption behavior of arsenite and arsenate on BCF, including adsorption isotherms, adsorption kinetics, the influence of pH and competing anions on adsorption, and column experiments. The adsorption data accorded with both Freundlich and Langmuir isotherms. The adsorption capacity for arsenite and arsenate was 99.6 and 33.2 mg/g BCF at pH 7.0 with an Fe content of 220 mg/mL. Kinetic data fitted well to the pseudo-second-order reaction model. Arsenate elimination was favored at acidic pH, whereas the adsorption of arsenite by BCF was found to be effective in a wide pH range of 5-11. Under the experimental conditions, the addition of sulfate had no effect on arsenic adsorption, whereas phosphate greatly influenced the elimination of both arsenite and aresenate. Silicate moderately decreased the adsorption of arsenite, but not arsenate. Both batch experiments and column experiments indicated that BCF had higher removal efficiency for arsenite than for arsenate. While the influent contaminant concentration was 500 μg/L in groundwater and the empty-bed contact time (EBCT) for arsenite and arsenate was 4.2 and 5.9 min, breakthrough empty-bed volumes at the WHO provisional guideline value of 10 μg/L were 2200 and 5000, respectively. BCF can be effectively regenerated when elution is done with 2 M NaOH solution. The column experiments for four cycles showed that stable and high removal efficiency of arsenic was sustained by BCF after regeneration.

Keywords: Oxide-Coated Sand, Surface Complexation, Activated Alumina, Manganese Oxides, Drinking-Water, Adsorption, Ferrihydrite, Kinetics, Sorption, As(V)

? Wang, X.K., Chen, C.L., Du, J.Z., Tan, X.L., Xu, D. and Yu, S.M. (2005), Effect of pH and aging time on the kinetic dissociation of 243Am(III) from humic acid-coated γ-Al2O3: A chelating resin exchange study. *Environmental Science & Technology*, **39** (18), 7084-7088.

Full Text: [2005\Env Sci Tec39, 7084.pdf](2005/Env%20Sci%20Tec39,%207084.pdf)

Abstract: The chelating resin was studied to assess its influence on metal availability and mobility in the environment. The association of organic-inorganic colloid-borne trace elements was investigated in this work. The radionuclide Am-243(III) was chosen as the representative and chemical homologue for trivalent lanthanide and actinide ions present in radioactive nuclear waste. The kinetic dissociation behavior of Am-243(III) from humic acid-coated gamma-Al2O3 was studied at pH values of 4.0 ± 0.1, 5.0 ± 0.2, and 6.0 ± 0.2 with a contact time of 2 days after the addition of a chelating cation exchanger resin. The concentrations of the components were: Am-243(III) 3.0×10-7 mol/L, gamma-Al2O3 0.5 g/L, HA 10 mg/L (pH 4.0 ± 0.1, 5.0 ± 0.2, and 6.0 ± 0.2) and 50 mg/L (pH 6.0 0.2), respectively. The kinetics of dissociation of 143 Am(Ill) after different equilibration time with humic acid-coated gamma-Al2O3 was also investigated at pH 5.0 ± 0.2. The experiments were carried out in air and at ambient temperature. The results suggest that the fraction of irreversible bonding of radionuclides to HA-coated Al2O3 increases with increasing pH and is independent of aging time. The assumption of two different Am-243(III)HA-Al2O3 species, with “fast” and “slow” dissociation kinetics, is required to explain the experimental results. Am-243(III) species present on HA-Al2O3 colloids moves from the “fast” to the “slow” dissociating sites with the increase of aging time.

Keywords: Aging, Air, Association, Availability, Behavior, Cation, Cation Exchanger, Cation-Exchange, Chelating Resin, Chemical, Colloids, Complexation, Environment, Equilibration, Eu(III), Experimental, Experiments, Fulvic-Acids, Gamma-Al2O3, Ions, Kinetic, Kinetics, Ligand-Exchange, Metal, Mobility, Model Solutions, Nickel Speciation, Nuclear-Magnetic-Resonance, pH, Radionuclides, Resin, Sorption, Species, Temperature, Trace Elements, Waste, Work

? McDowell, D.C., Huber, M.M., Wagner, M., Von Gunten, U. and Ternes, T.A. (2005), Ozonation of carbamazepine in drinking water: Identification and kinetic study of major oxidation products. *Environmental Science & Technology*, **39** (20), 8014-8022.

Full Text: [2005\Env Sci Tec39, 8014.pdf](2005/Env%20Sci%20Tec39,%208014.pdf)

Abstract: Kinetics and product formation of the anti-epileptic drug carbamazepine (CBZ) were investigated in lab-scale experiments during reactions with ozone and OH radicals. Ozone reacts rapidly with the double bond in CBZ, yielding several ozonation products containing quinazoline-based functional groups. The structures for three new oxidation products were elucidated using a combination of mass spectrometric and NMR techniques. The three products were determined to be 1-(2-benzaldehyde)-4-hydro(1H, 3M-quinazoline-2-one (130,M), 1-(2-benzaldehyde)(1 (1H,3H)-quinazoline-2,4-dione (130), and 1-(2-benzoic acid)(1H, 3M-quinazoline-2,4-dione (BaQD). Additional kinetic studies of the ozonation products showed very slow subsequent oxidation kinetics with ozone (second-order rate constants, k(O3) = similar to 7 M-1 s-1 and similar to 1 M-1 s-1 at pH 6 for BQM and BOO, respectively). Rate constants for reactions with OH radicals, k(OH), were determined as similar to 7×109 M-1 s-1 for BUM and similar to 5×109 M-1 s-1 for BQD. Thus, mainly reactions with OH radicals lead to their further oxidation. A kinetic model including ozone and OH radical reactions allows a prediction of the time-dependent product distribution during ozonation of natural waters. In Rhine River water, CBZ spiked at 500 ng/L was completely oxidized by ozone with applied doses > = 0.3 mg/L. To confirm that the two major ozonation products BQM and BQD are produced as a result of the ozonation of a CBZ-containing natural water, Lake Zurich water samples were spiked with CBZ (1 μM, 236 μg/L). The oxidation products were identified via LC-UV. Concentrations of 0.48 and 0.15 μM for BQM and BQD, respectively, were measured for an ozone dose of 1.9 mg/L. BQM and BQD were also identified in ozonated water from a German waterworks containing CBZ in its raw water with 0.07-0.20 μg/L. Currently, there are no data available on the biological effects of the formed oxidation products.

Keywords: Sewage-Treatment Plants, Waste-Water, Aqueous-Solution, Rate Constants, Pharmaceuticals, Ozone, Removal, Degradation, Radicals, Program

? Deng, S.B. and Ting, Y.P. (2005), Polyethylenimine-modified fungal biomass as a high-capacity biosorbent for Cr(VI) anions: Sorption capacity and uptake mechisms. *Environmental Science & Technology*, **39** (21), 8490-8496.

Full Text: [2005\Env Sci Tec39, 8490.pdf](2005/Env%20Sci%20Tec39,%208490.pdf)

Abstract: Heavy metal pollution in the aqueous environment is a problem of global concern. Biosorption has been considered as a promising technology for the removal of low levels of toxic metals from industrial effluents and natural waters. A modified fungal biomass of Penicillium chrysogenum with positive surface charges was prepared by grafting polyethylenimine (PEI) onto the biomass surface in a two-step reaction. The presence of PEI on the biomass surface was verified by FTIR and X-ray photoelectron spectroscopy (XPS) analyses. Due to the high density of amine groups in the long chains of PEI molecules on the surface, the modified biomass was found to possess positive zeta potential at pH below 10.4 as well as high sorption capacity for anionic Cr(VI). Using the Langmuir adsorption isotherm, the maximum sorption capacity for Cr(VI) at a pH range of 4.3-5.5 was 5.37 mmol/g of biomass dry weight, the highest sorption capacity for Cr(VI) compared to other sorbents reported in the literature. Scanning electronic microscopy (SEM) provided evidence of chromium aggregates formed on the biomass surface. XPS results verified the presence of Cr(III) on the biomass surface in the pH range 2.5-10.5, suggesting that some Cr(VI) anions were reduced to Cr(III) during the sorption. The sorption kinetics indicated that redox reaction occurred on the biomass surface, and whether the converted Cr(III) ions were released to solution or adsorbed on the biomass depended on the solution pH. Sorption mechanisms including electrostatic interaction, chelation, and precipitation were found to be involved in the complex sorption of chromium on the PEI-modified biomass.

Keywords: Adsorption, Adsorption Isotherm, Aggregates, Aminated Polyacrylonitrile Fibers, Amine, Aqueous-Solution, Biomass, Biosorbent, Biosorption, Capacity, Chromium, Complex, Cr(VI), Density, Effluents, Environment, Ftir, Fungal Biomass, Global, Grafting, Heavy-Metals, Hexavalent Chromium, Interaction, Isotherm, Kinetics, Mechanisms, Metals, Microscopy, Natural, Natural Waters, PEI, pH, Photoelectron Spectroscopy, Pollution, Polyethylenimine, Precipitation, Range, Reaction, Redox, Redox Reaction, Removal, Rhizopus-Nigricans, SEM, Sorption, Sorption Capacity, Sorption Kinetics, Spectroscopy, Surface, Uptake, Wastewaters, X-Ray Photoelectron Spectroscopy, XPS, Zeta Potential

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Full Text: [2005\Env Sci Tec39, 8958.pdf](2005/Env%20Sci%20Tec39,%208958.pdf)

Abstract: A synthetic molecularly imprinted polymer (MIP) sorbent forestrogenic compounds was prepared using a noncovalent imprinting technique. MIP microspheres sized from 1 to 2 mu m were synthesized in acetonitrile by using alpha-estradiol as the template, acrylamide as the functional monomer, and trimethylpropanol trimethacrylate as the cross-linker. When compared with the nonimprinted polymer (NIP), the MIP showed outstanding affinity toward alpha-estradiol in aqueous solution with a binding site capacity (B-max) of 380 nmol mg-1 MIP, imprinting effect of 35, and a dissociation constant (K-d) of 38 mu M. The MIP exhibited significant binding affinity toward other related estrogenic compounds such as beta-estradiol, diethylstilbestrol, estriol, and estrone, suggesting that this material may be appropriate for treating a complex mixture of estrogenic pollutants. The feasibility of removing estrogenic compounds from environmental water by the MIP was demonstrated using lake water spiked with alpha-estradiol. In addition, the MIP reusability without any deterioration in performance was demonstrated for at least five repeated cycles.

Keywords: Sewage-Treatment Plants, Beta-Estradiol, Oral-Contraceptives, Endocrine Function, In-Vitro, Chemicals, Environment, Receptors, Effluents, Recognition

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Full Text: [2006\Env Sci Tec40, 2714.pdf](2006/Env%20Sci%20Tec40,%202714.pdf)

Abstract: Noncarbonaceous materials or mineral oxides (silica gel, alumina, molecular sieves, zeolites, and montmorillonite) were modified with various functional groups such as amine, amide, thiol, urea, and active additives such as elemental sulfur, sodium sulfide, and sodium polysulfide to examine their potential as sorbents for the removal of elemental mercury (Hg0) vapor at coal-fired utility power plants. A number of sorbent candidates such as amine- silica gel, urea- silica gel, thiol- silica gel, amide-silica gel, sulfur- alumina, sulfur-molecular sieve, sulfur-montmorillonite, sodium sulfide-montmorillonite, and sodium polysulfide-montmorillonite, were synthesized and tested in a lab-scale fixed-bed system under an argon flow for screening purposes at 70°C and, or 140°C. Several functionalized silica materials reported in previous studies to effectively control heavy metals in the aqueous phase showed insignificant adsorption capacities for Hg0 control in the gas phase, suggesting that mercury removal mechanisms in both phases are different. Among elemental sulfur-, sodium sulfide-, and sodium polysulfide-impregnated inorganic samples, sodium polysulfide-impregnated montmorillonite K 10 showed a moderate adsorption capacity at 70 degrees C, which can be used for sorbent injection prior to the wet FGD system.

Keywords: Activated Carbons, Adsorption, Adsorption Capacity, Aqueous, Capacity, Clay, Coal-Fired, Fixed-Bed, Flue-Gas, Groups, Heavy Metals, Ions, Mechanisms, Mercury, Mercury Control, Metals, Molecular Sieves, Montmorillonite, Power Plants, Removal, Silica, Sodium, Sorption, Sulfur-Impregnated Adsorbents, System, Vapor

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Full Text: [2006\Env Sci Tec40, 3064.pdf](2006/Env%20Sci%20Tec40,%203064.pdf)

Abstract: This paper introduced a simple method of treating Cr(VI)-bearing toxic wastewaters using a natural mineral: clinopyrrhotite. Laboratory bench-scale mixing experiments were carried out in both Cr(VI)-bearing artificial solutions and industrial wastewaters under controlled conditions. The effects of solution pH, Cr(VI) concentration, mineral grain size, mineral/solution ratio, and reaction time on the Cr(VI) removal were studied. Chromium was effectively removed from the solutions and wastewaters. After the treatment, the liquid was clean enough to be discharged directly into the natural environment. The Cr(VI) removal process involved sequentially the adsorption of Cr(VI), in the form of Cr2O72- or CrO42-, onto the mineral surface, the reduction of the adsorbed Cr(VI) to Cr(III), catalyzed at the vacant Fe sites of the mineral, and finally the precipitation of Cr(III) as Cr2S3, Cr2O3, and Cr(OH)3 solid phases. Conditions such as a fine mineral grain size, an excessive quantity of clino-pyrrhotite and a weak acidic media, favored the removal process. For clino-pyrrhotite with a restricted grain size, the minimum required quantity of the mineral was proportional to the total quantity of Cr(VI) to be removed. Quantitatively, one cubic meter of industrial wastewater that contained similar to 1 mmol dm-3 of Cr(VI) and had a pH value between 1 and 10 would be effectively treated after it was in contact with 220 kg of 145±28 μm clinopyrrhotite for an hour. Furthermore, the quantity of the final solid waste byproduct was small, and the solid residue of clino-pyrrhotite could be reused after a simple rinse with water. Compared to the previous Cr(VI)-bearing wastewater treatment schemes, this method was simple, effective, economical, and environmentally sound. It has great potential for use in industrial-scale applications.

Keywords: Adsorption, Chromium, Cr(VI), Cr(VI)-Bearing Wastewater, Hexavalent Chromium, Industrial Wastewaters, Iron, Minerals, Reduction, Removal, Soil, Sorption, Treatment, Wastewater, Wastewater Treatment, Water

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Full Text: [2006\Env Sci Tec40, 4181.pdf](2006/Env%20Sci%20Tec40,%204181.pdf)

Abstract: Studies have shown that biomaterials have the capacity to adsorb heavy metals and metal oxo-cations from aqueous solution. In addition, previous studies have shown that biomaterials have the ability to bind uranyl cations from solution with capacities that are comparable to or greater than some commercially available synthetic ion-exchange resins. By using chemical modification, inductively coupled plasma optical emission spectroscopy (ICP-OES), and X-ray absorption spectroscopy (XAS), we have found that the primary functional group on alfalfa biomass responsible for the binding of uranyl cations from aqueous solution is the carboxyl functionality. Batch pH dependency experiments show a direct relationship between the increase in binding and the increase in pH (up to pH 4.5). XAS experiments showed that the major ligand involved in the binding of uranyl cations from aqueous solution was either a nitrogen or oxygen ligand with coordination numbers ranging from 6 to 10 +/- 1.

Keywords: Absorption, Absorption Spectroscopy, Alfalfa, Binding, Biomass, Biosorption, Capacity, Cells, Chemical, Chemical Modification, Coordination, Copper(II), Dependency, Exafs, Heavy Metals, Heavy-Metals, Inductively Coupled Plasma, Ion Exchange, Medicago-Sativa Alfalfa, Metals, Modification, Near-Edge Structure, Nitrogen, Oxygen, pH, Plasma, Resins, Spectroscopy, Uranium Speciation, X-Ray Absorption Spectroscopy, X-Ray-Absorption

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Full Text: [2006\Env Sci Tec40, 7186.pdf](2006/Env%20Sci%20Tec40,%207186.pdf)

Abstract: The complexing agents benzotriazole (BT) and tolyltriazole (TT) are not only widely applied as anticorrosives, e. g., in aircraft deicer and anti-icer fluid (ADAF), but they are also used for so-called silver protection in dishwasher detergents. Due to their low biodegradability and limited sorption tendency, BT and TT are only partly removed in wastewater treatment. Residual concentrations of BT and TT were determined in ambient surface waters in Switzerland including 7 rivers which have distinct water flows and receive treated wastewater effluents at various dilution ratios. A maximum BT concentration of 6.3 mu g/L was found in the Glatt River, and a maximum mass flow of 277 kg BT per week was observed in the Rhine River. In most cases, TT was about a factor 5-10 less abundant. During winter 2003/4, BT mass flows at 2 locations in the lower stretch of the Glatt River clearly indicated the input from nearby Zurich airport, where BT was applied as an anticorrosive ADAF component. BT concentrations measured in the three lakes Greifensee, Lake Zurich, and Lake Geneva were approximately 1.2, 0.1-0.4, and 0.2 mu g/L, respectively. The observed environmental occurrences indicate that BT and TT are ubiquitous contaminants in the aquatic environment and that they belong to the most abundant individual water pollutants.

Keywords: Waste-Water, Field-Measurements, Surface Waters, Deicing Fluids, Switzerland, Additives, Fate, Pharmaceuticals, Diclofenac, Samples

? Sharma, V.K., Mishra, S.K. and Nesnas, N. (2006), Oxidation of sulfonamide antimicrobials by ferrate(VI) [(FeVIO42-)]-. *Environmental Science & Technology*, **40** (23), 7222-7227.

Full Text: [2006\Env Sci Tec40, 7222.pdf](2006/Env%20Sci%20Tec40,%207222.pdf)

Abstract: Sulfonamide antimicrobials are used in both human therapy and animal husbandry. Sulfonamides are not readily biodegradable and have been detected in surface water and in secondary wastewater effluents. The chemical oxidation of sulfonamides by an environmentally friendly oxidant, ferrate(VI) ((FeO42-)-O-VI, Fe(VI)), was conducted. The sulfonamides used in the oxidation studies were sulfisoxazole, sulfamethazine, sulfamethizole, sulfadimethoxine, and sulfamethoxazole. Kinetics of the reactions were determined as a function of pH (7.0-9.7) and temperature (15-45°C) by a stopped-flow technique. The rate law for the oxidation of sulfonamides by Fe(VI) is first-order with respect to each reactant. The observed second-order rate constants decreased nonlinearly with an increase in pH and are possibly related to the protonation of Fe(VI) (HFeO4- <-> H+ + FeO42-; pK(a),(HFeO4) = 7.23) and sulfonamides (SH <-> H+ + S-; pK(a),(SH) = 5.0-7.4). The activation parameters of the reactions vary with pH due to temperature dependence on the protonation of Fe(VI) and sulfonamides. These results were used to obtain enthalpy of dissociation of sulfonamides. Stoichiometry and products of sulfamethoxazole (SMX) reactions with Fe(VI) were studied in detail using various analytical techniques to evaluate the effect of the oxidation process on the fate of sulfonamides in water. At a stoichiometric ratio of 4: 1 (Fe(VI): SMX), complete removal of SMX was achieved. Analyses of oxidation products of the reaction as well as kinetic measurements of substructural models of SMX suggest that the attack of Fe(VI) occurs at the isoxazole moiety as well as at the aniline moiety with minimal preference. The results of the studies reported suggest that Fe(VI) has the potential to serve as a chemical oxidant for removing sulfonamides and converting them to relatively less toxic byproducts in water.

Keywords: Waste-Water Treatment, Potassium Ferrate(VI), Human Pharmaceuticals, Endocrine Disruptors, Aquatic Environment, Heterocyclic Groups, Sulfa Drugs, Reactivity, Kinetics, Oxidant

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Full Text: [2006\Env Sci Tec40, 7662.pdf](2006/Env%20Sci%20Tec40,%207662.pdf)

Abstract: Desorption of organic contaminants from soil can be modeled by dividing the desorption time-concentration profile into three distinct regimes. These are characterized by desorption that occurs faster than the experimental sampling scheme, at a rate that is captured by it, and at a rate for which the duration of the experiment and data uncertainty obscures the rate. Batch desorption curves for atrazine and naphthalene on four soils were experimentally generated to demonstrate the existence of discrete observational desorption regimes. Nine mathematical models, each containing mechanisms formulated to describe at least one of the three regimes, were fit to each contaminant-soil combination using the Gauss-Newton method for parameter estimation. Each of the nine models was ranked using the small-sample-corrected Akaike information criterion (AIC(c)). By interpretation of the AICc values, the atrazine desorption data were best described by three regimes, while the naphthalene desorption data were best described by two regimes. Furthermore, for a given number of regimes, we could find no general basis to suggest that a particular type of rate model (chemical, physical, kinetic, or statistical) is intrinsically superior over another.

Keywords: Halogenated Organic-Chemicals, Long-Term Sorption, Aquifer Material, Porous-Media, Polyaromatic Hydrocarbons, Natural Sediments, Reactive Solutes, Naphthalene, Transport, Equilibrium

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Full Text: [2007\Env Sci Tec41, 2022.pdf](2007/Env%20Sci%20Tec41,%202022.pdf)

Abstract: Batch experiments were performed to investigate the feasibility of humic acid (HA) removal by synthetic nanoscale zerovalent iron (NZVI) and its interaction with As(III) and As(V), the most poisonous and abundant of groundwater pollutants. High-resolution transmission electron microscopy (HR-TEM) and X-ray diffraction (XRD) were used to characterize the particle size, surface morphology of the pristine NZVI and HA-treated NZVI (NZVI-HA), and the zero valence state of the pristine NZVI. It was determined that HA was completely removed by NZVI (0.3 g/L) within a few minutes, at a wide range of initial pH values (similar to 3.0-12.0). Fourier transform infrared (FTIR) and laser light scattering (zeta potential measurement) studies confirmed that NZVI-HA forms inner-sphere surface complexation at different initial pH conditions. The effects of competing anions showed that there was complete removal of HA in the presence of 10 mM NO3- and SO42- whereas HA removal was observed 0%, 18% and 22% in presence of 10 mM H2PO42-, HCO3- and H4SiO40, respectively. However, the presence of 2 mM Ca2+ and Mg2+ enhanced HA removal from 17 mg g-1 to 76 mg g-1 and 55 mg g-1, respectively. Long-term time-resolved studies of XRD and field emission scanning electron microscopy (FE-SEM) with energy-dispersive X-ray (EDX) revealed the formation of various types of new iron oxides (magnetite, maghemite, and lepidocrocites) during the continuous reaction of HA in the presence of water and NZVI at 1, 30, 60, and 90 days. In addition, the surface-area-normalized rate constant (k(sa)) of adsorption of As(III) and As(V) onto NZVI was reduced in the presence of HA (20 mg L-1), from 100% to 43% and 68%, respectively. Our results show the potential use of NZVI in removing HA and its possible effects on arsenic removal during the application of NZVI in groundwater remediation.

Keywords: Acid, Adsorption, Anions, Arsenic, Arsenic Removal, As(III), Bromate Reduction, Complexation, EDX, Effects, Electron Microscopy, Emission, Ftir, Fulvic-Acid, Goethite, Groundwater, Groundwater Treatment, Hematite, Hrtem, Humic, Humic Acid, Interaction, Iron, Iron Oxides, Kinetics, Laser Light Scattering, Light, Light Scattering, Measurement, Microscopy, Morphology, Natural Organic-Matter, NO3, Oxides, Particle, Particle Size, Particles, pH, pH Values, Phosphate, Pollutants, Range, Rate Constant, Reaction, Remediation, Removal, Scanning Electron Microscopy, Surface, Surface Complexation, Surface Morphology, Water, X-Ray Diffraction, XRD, Zero-Valent Iron, Zeta Potential, Zeta-Potential

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Full Text: [2007\Env Sci Tec41, 2343.pdf](2007/Env%20Sci%20Tec41,%202343.pdf)

Abstract: We use Monod kinetics to calibrate previously published data that document the aerobic biodegradation of hydrocarbon vapors in soil microcosms from a weathered petroleum spill site. Monod kinetics offer insight into biodegradation mechanics because they address biomass growth as well as substrate depletion. A blend of five aromatics and five alkanes dose the microcosm sets at four strengths, and a finite difference model describes the response superimposed across the constituent substrates. An observed initial biomass X-O of 125 g biomass/m3 soil moisture and an endogendous decay rate b of 0.102 day-1 calibrate all four dosages and agree with heterotrophic plate counts. Common maximum specific growth rates mu(MJ) and half saturation constants K-SJ calibrate each constituent across the four dosages. The biodegradable alkanes exhibit mu(MJ) values ranging from 0.0190 to 0.0996 day-1, while the aromatic rates vary from 0.0946 to 0.322 day-1. One of the alkanes (2,2,4-trimethylpentane) is recalcitrant. The half saturation constants range from 0.000083 to 0.000355 g substrate/m(3) soil moisture for the biodegradable alkanes, which imply zero-order kinetics. The aromatic K-SJ values vary from 5.02 to 14.3 g substrate/m3 soil moisture, and suggest first-order kinetics. The yield Y-J increases with dosage concentration for all the biodegradable constituents, varying from 0.0533 to 1.58 g biomass/g substrate.

Keywords: Sandy Aquifer Material, Organic-Compounds, Degradation Rate, Transport, Vapors, Water, Attenuation, Simulation, Parameters, Toluene

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Full Text: [2007\Env Sci Tec41, 3322.pdf](2007/Env%20Sci%20Tec41,%203322.pdf)

Abstract: Two reactive media [zerovalent iron (ZVI, Fisher Fe-0) and amorphous hydrous ferric oxide (HFO)- incorporated porous, naturally occurring aluminum silicate diatomite [designated as Fe (25%)-diatomite]], were tested for batch kinetic, pH- controlled differential column batch reactors (DCBRs), in small- and large- scale column tests (about 50 and 900 mL of bed volume) with groundwater from a hazardous waste site containing high concentrations of arsenic (both organic and inorganic species), as well as other toxic or carcinogenic volatile and semivolatile organic compounds (VOC/SVOCs). Granular activated carbon (GAC) was also included as a reactive media since a permeable reactive barrier (PRB) at the subject site would need to address the hazardous VOC/ SVOC contamination as well as arsenic. The groundwater contained an extremely high arsenic concentration (341 mg L-1) and the results of ion chromatography and inductively coupled plasma mass spectrometry (IC-ICP-MS) analysis showed that the dominant arsenic species were arsenite (45.1%) and monomethyl arsenic acid (MMAA, 22.7%), while dimethyl arsenic acid (DMAA) and arsenate were only 2.4 and 1.3%, respectively. Based on these proportions of arsenic species and the initial As-to-Fe molar ratio (0.15 mol(As) mol(Fe)-1), batch kinetic tests revealed that the sorption density (0.076 mol(As) mol(Fe)-1) for Fe (25%)-diatomite seems to be less than the expected value (0.086 mol(As) mol(Fe)-1) calculated from the sorption density data reported by Lafferty and Loeppert (Environ. Sci. Technol. 2005, 39, 21202127), implying that natural organic matters (NOMs) might play a significant role in reducing arsenic removal efficiency. The results of pH- controlled DCBR tests using different synthetic species of arsenic solution showed that the humic acid inhibited the MMAA removal of Fe (25%)diatomite more than arsenite. The mixed system of GAC and Fe (25%)-diatomite increased the arsenic sorption speed to more than that of either individual media alone. This increase might be deduced by the fact that the addition of GAC could enhance arsenic removal performance of Fe (25%)-diatomite through removing comparably high portions of NOMs. Small- and large-scale column studies demonstrated that the empty bed contact time (EBCT) significantly affected sorpton capacities at breakthrough (C = 0.5 C-0) for the Fe-0/sand (50/50, w/w) mixture, but not for GAC preloaded Fe (25%)-diatomite. In the large-scale column tests with actual groundwater conditions, the GAC preloaded Fe (25%)diatomite effectively reduced arsenic to below 50 mu g L-1 for 44 days; additionally, most species of VOC/SVOCs were also simultaneously attenuated to levels below detection.

Keywords: Zero-Valent Iron, Permeable Reactive Barrier, Zerovalent Iron, Chlorinated Ethylenes, Removal, Sorption, Adsorption, Kinetics, Degradation, Column

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Full Text: [2007\Env Sci Tec41, 3296.pdf](2007/Env%20Sci%20Tec41,%203296.pdf)

Abstract: Phosphorus (P) removal mechanisms from waste stabilization pond effluent by a melter slag filter were investigated. The studied filter had treated pond effluent for a decade, but lost its P removal efficiency after 5 years. The P distribution in the slag was examined by scanning electron microscopy (SEM), electron dispersive spectrometry (EDS), X- ray fluorescence (XRF), X-ray diffraction (XRD), and chemical fractionation. The results showed the slag to be covered by a film comprising metal oxides/oxyhydroxides, organic resin, and Fe-phosphate precipitates. The slag porous matrix beneath this film hosted lower P concentrations and consisted of metal oxides/oxyhydroxides and calc-magnesium silicates. The study revealed the following mechanisms for P removal from effluent by the melter slag: (1) P adsorption onto metal oxides/oxyhydroxides which are ubiquitous throughout the porous slag matrix and its surface film; (2) P precipitation, mainly as Fe-phosphates (determined by SEM/EDS) on the surface film, derived from the release of metal ions into the solution phase; and ( 3) P sequestration by an amorphous organic resin that comprises a substantial proportion of the surface film, which was deduced by SEM/EDS and XRF. Results of chemical extractions performed on the slag demonstrated that 1 M HCI, which has been used to determine Ca-associated P in previous studies, is an unreliable Ca-P marker. By contrast, the citrate-dithionite reagent was shown to be a good indicator of Fe/Al-associated P and revealed that adsorption onto metal oxides/oxyhydroxides, in the porous matrix as well as its surface film, is the most significant P removal mechanism achieved by the slag filter.

Keywords: Adsorption, Blast-Furnace Slag, Constructed Wetland Systems, EDS, HCI, Ions, Mechanism, Microscopy, Phosphate, Recovery, Sequential Extraction, Soils, Sorption Characteristics, Steel Slag, Water Treatment, XRD, XRF

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Full Text: [2007\Env Sci Tec41, 3573.pdf](2007/Env%20Sci%20Tec41,%203573.pdf)

Abstract: This research shows for the first time the degradation of linear alkylbenzene sulfonates (LAS) under anaerobic conditions, together with the presence of metabolites and the identification of microorganisms involved in this process. This compound is the most widely used surfactant and its main environmental concern is related to its persistence in the absence of oxygen as LAS accumulates in anaerobic sediments and sewage sludges. Laboratory experiments performed with anoxic marine sediments spiked with 10-50 ppm of LAS demonstrated, however, that its degradation reached 79% in 165 days via the generation of sulfophenyl carboxylic acids (SPCs). Almost all of the added LAS (> 99%) was found to be attached to the sediment while the less hydrophobic SPCs were predominant in solution, as their concentration increased progressively up to 3 ppm during the full course of the experiment. Average half-life for LAS has been estimated to be 90 days, although higher values should be expected when the LAS concentration exceeds 20 ppm, due to inhibition of the microbial community. Sulfate-reducing and methanogenic activities proved to be intense during the experiment. Several sulfate-reducing bacteria and firmicutes/clostridia have been identified as possible candidates for effecting this degradation. Our results imply that the persistence of LAS in anoxic compartments, such as marine sediments, should be reconsidered when evaluating its environmental risk.

Keywords: Sulfate-Reducing Bacteria, Microbial Community, SP-NOV., Biodegradation, Environment, Sulfur, Las, Surfactants, Products, Arylsulfonates

? Lara-Martin, P.A., Gomez-Parra, A., Kochling, T., Sanz, J.L. and Gonzalez-Mazo, E. (2007), Monitoring the primary biodegradation of linear alkylbenzene sulfonates and their coproducts in anoxic sediments using liquid chromatography-mass spectrometry. *Environmental Science & Technology*, **41** (10), 3580-3586.

Full Text: [2007\Env Sci Tec41, 3580.pdf](2007/Env%20Sci%20Tec41,%203580.pdf)

Abstract: An accompanying article has demonstrated the anaerobic degradation of the surfactant linear alkylbenzene sulfonate (LAS) in microcosms filled with marine sediments through the generation of sulfophenylcarboxylic acids (SPCs). A detailed study shows that this process was uniform in the blanks (non-spiked natural sediments) for every LAS homologue during the complete course of the experiment. However, when sediments were spiked with commercial LAS and, therefore, enriched with short-chain homologues, degradation was enhanced for these homologues until their percentages were close to those for non-spiked sediments. The reason is that short-chain homologues are more bioavailable due to their higher solubility and lower sorption capacity. Thus, sorption on sediments was found to be increased with the length of the alkyl chain for LAS homologues, following a linear Freundlich isotherm, whereas the metabolites generated were predominant in solution due to their much higher polarity. Intermediate-chain SPC homologues (C-7-C-9 SPCs) were the most abundant during the experiment, but a significant increase in the concentration of shorter-chain SPC homologues (C-4-C-6 SPCs) was detected toward the end. In the case of isomers, the steric effect of the aromatic group implies that LAS primary degradation took place preferentially over external isomers. Therefore, the generation of external isomers of SPCs was predominant during the complete experiment although internal isomers of SPCs became more evident when the degradation process had advanced and external isomers of LAS became scarce. The identity of both types of SPC isomer was confirmed by tandem mass spectrometry. With respect to LAS coproducts, the relative percentage of iso-LAS increased during the complete experiment and removal percentages for dialkyl tetralinsulfonates (< 30%) were typically lower that those for LAS (66-79%), although a similar behavior was observed for their homologues in both cases.

Keywords: Anaerobic Conditions, Alkyl Benzenesulfonates, Degradation-Products, Fate, Surfactants, Water, Las, Dialkyltetralinsulfonates, Mineralization, Ethoxylates

? Tsang, D.C.W., Lo, I.M.C. and Chan, K.L. (2007), Modeling the transport of metals with rate-limited EDTA-promoted extraction and dissolution during EDTA-flushing of copper-contaminated soils. *Environmental Science & Technology*, **41** (10), 3660-3666.

Full Text: [2007\Env Sci Tec41, 3660.pdf](2007/Env%20Sci%20Tec41,%203660.pdf)

Abstract: EDTA-flushing of artificially contaminated soils enhanced Cu extraction but also induced mineral dissolution simultaneously. The mobilization and transport of these metal-EDTA complexes was investigated with column experiments. A quantitative transport model was proposed for simulating the experimental breakthrough curves of Cu, Fe, Al, and Ca. The rate-limited EDTA-promoted extraction and dissolution could be described by respective second-order kinetic terms, which were necessary for explaining the time-dependent depletion of extractable metals (sorbed and indigenous) in soils with continuous EDTA-flushing. Simultaneous simulation of extraction of sorbed Cu and dissolution of soil Fe, Al, and Ca is more conceptually accurate than individual modeling of each metal because the latter approach tends to overestimate the concentration of free EDTA during transport and thus underestimate the rate coefficients of EDTA-promoted dissolution. The fitted rate coefficients of Cu were about an order of magnitude larger than those of Fe and Al; these values probably reflect Cu extraction from weakly sorbed fractions and Fe and Al dissolution from amorphous oxides. The apparent retardation of Fe, Al, and Ca transport had to be taken into account by empirical determination, which was attributed to the metal lability in soils and thermodynamics of surface complexation.

Keywords: Adsorption, Amorphous, Breakthrough, Breakthrough Curves, Chelating-Agents, Column, Column Experiments, Column Extraction, Complexation, Complexes, Concentration, Contaminated Soils, Cu, Decontamination, Determination, Dissolution, Edta, Ethylenediaminetetraacetate, Extraction, Fractions, Heavy-Metals, Kinetic, Lability, Lead, Metal, Metals, Mineral, Mobilization, Model, Modeling, Order, Oxides, Pb, Retardation, Second Order, Simulation, Soil, Soils, Sorbed, Surface, Surface Complexation, Thermodynamics, Transport, Transport Model

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Full Text: [2007\Env Sci Tec41, 4748.pdf](2007/Env%20Sci%20Tec41,%204748.pdf)

Abstract: A composite sorbent (GAC-QPVP) was prepared by coating poly(4-vinylpyridine) onto a granular activated carbon, followed by cross-linking and quaternization processes. The sorbent was characterized by scanning electron microscopy, point of zero charge measurement, and BET analysis. Batch experiments with variable pH, ionic strength, and concentrations of Cr(VI), sorbent, and competing anions were conducted to evaluate the selective sorption of Cr(VI) from aqueous solutions. The results showed that Cr(VI) sorption rates could be described by a reversible second-order kinetics, and equilibrium uptake of Cr(VI) increased with decreasing pH, decreasing ionic strength, and increasing sorbent concentration. The estimated maximum equilibrium uptake of chromium was 53.7 mg/g at pH = 2.25, 30.7 mg/g at pH = 3.65, and 18.9 mg/g at pH = 6.03, much higher than the maximum capacity of PVPcoated silica gel, an adsorbent for Cr examined previously. When compared with the untreated granular activated carbon, sorption onto GAC-QPVP resulted in much less Cr(VI) reduction and subsequent release of Cr(III). The effect of phosphate, sulfate, and nitrate was minor on the selective sorption of Cr(VI). An ion exchange model that was linked with aqueous speciation chemistry described Cr(VI) sorption reasonably well as a function of pH, ionic strength, and Cr(VI) concentration. Model simulations suggested that sorbed Cr(VI) was partially reduced to Cr(III) on the sorbent when pH was less than 4. The presence of Cr(III) on the sorbent was confirmed by the X-ray photoelectron spectroscopic analysis. Overall, the study has demonstrated that GAC-QPVP can effectively remove Cr(VI) from aqueous solutions under a wide range of experimental conditions, without significant Cr(III) release associated with the virgin GAC treatment.

Keywords: Activated Carbon, Adsorbent, Adsorption, Analysis, Anions, Aqueous Solution, Aqueous Solutions, BET, Biosorbent, Biosorption, Capacity, Carbon, Charge, Chromium, Coating, Composite, Composite Sorbent, Concentration, Concentrations, Cr, Cr(III), Cr(VI), Cr(VI) Reduction, Cr(VI) Removal, Cr(VI) Sorption, Cross-Linking, Crosslinking, Electron Microscopy, Equilibrium, Experimental, Function, Gac, Gel, Granular, Granular Activated Carbon, Groundwater, Heavy, Hexavalent Chromium, Ion, Ion Exchange, Ion-Exchange, Ionic Strength, Kinetics, Measurement, Microscopy, Model, Nitrate, pH, Phosphate, Poly(4-Vinylpyridine), Range, Reduction, Release, Removal, Reversible, Scanning Electron Microscopy, Second Order, Second Order Kinetics, Second-Order Kinetics, Selective, Silica, Silica Gel, Solutions, Sorbed, Sorbent, Sorption, Speciation, Strength, Sulfate, Treatment, Uptake, Waste-Water, Zero Charge

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Full Text: [2007\Env Sci Tec41, 4888.pdf](2007/Env%20Sci%20Tec41,%204888.pdf)

Abstract: Improved understanding of the physical, chemical, and thermodynamic properties of soil and sediment organic matter (SOM) is crucial in elucidating sorption mechanisms of hydrophobic organic compounds (HOCs) in soils and sediments. In this study, several thermoanalytical techniques, including thermal gravimetric analysis (TGA), differential scanning calorimetry (DSC) temperature-modulated differential scanning calorimetry (TMDSC), and thermal mechanical analysis (TMA) were applied to 13 different organic materials (three woods, two humic acids, three kerogens, and five black carbons) representing a spectrum of diagenetic and/or thermal histories. Second-order thermal transition temperatures (T-t) were identified in most materials, where the highest observed Tt values (typically characterized as glass transition temperatures (T-g)) were shown to closely relate to chemical characteristics of the organic samples as influenced by diagenetic or thermal alteration. Results further suggest a positive correlation between glass transition temperature and a defined diagenetic/thermal index, where humic-based SOM (e.g., humic and fulvic acids) possess lower transition temperatures than more “mature” carbonaceous-based SOM (i.e., kerogens and black carbons). The observed higher thermal transition temperature of aliphatic-rich Green River shale kerogen (similar to 120°C) relative to that of aromatic-rich humic acids suggests that a sole correlation of aromaticity to thermal transition temperature may be inappropriate.

Keywords: Acid, Acids, Analysis, Aqueous-Solution, Biopolymers, Black Carbon, Calorimetry, Characteristics, Chemical, Correlation, Differential, Differential Scanning Calorimetry, Distributed Reactivity Model, DSC, Fulvic Acids, Glass, Glass Transition, Glass Transition Temperature, Glass-Transition, Hocs, Humic, Humic Acids, Hydrophobic, Hydrophobic Organic Compounds, Index, Investigation, Kerogen, Macromolecular Characteristics, Materials, Matter, Mechanisms, Nonlinear Sorption, Nuclear-Magnetic-Resonance, Organic, Organic Compounds, Organic Matter, Physical, Porous-Media, Properties, Relaxation Behavior, Sediment, Sediment Organic Matter, Sediments, Shale, Soil, Soils, SOM, Sorption, Sorption Mechanisms, Techniques, Temperature, Temperatures, TGA, Thermodynamic, Thermodynamic Properties, TMA

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Full Text: [2008\Env Sci Tec42, 766.pdf](2008/Env%20Sci%20Tec42,%20766.pdf)

Abstract: A carbon slurry, produced in generators of fuel-oil-based industrial generators was converted into an effective and efficient adsorbent for the removal of endosulfan and methoxychlor from aqueous solution. The adsorbent was chemically treated, activated, characterized, and used for the adsorption of endosulfan and methoxychlor pesticides. The maximum adsorption was found at 90 min, 6.5 pH, 0.025 g/L dose, and 25 C temperature. Langmuir and Freundlich adsorption models were applied to analyze adsorption data, and the former was found applicable to this adsorption system in terms of relatively high regression values. The thermodynamic aspect of the process was also investigated by evaluating certain important parameters (enthalpy, free energy, and entropy of system). Kinetics of adsorption was found to follow the pseudo second order rate equation. The diffusion of pesticides into carbon slurry pores was suggested to be the rate controlling step by applying Bangham’s equation. Adsorption on a column was also investigated in a continuous flow system. Adsorption efficiencies of endosulfan and methoxychlor were 34.11 and 36.06 mg/g in batch processes and 32.62 and 33.52 mg/g in column operations, respectively.

Keywords: Adsorbent, Adsorption, Aqueous Solution, Atrazine, Carbon, Diffusion, Ions, Langmuir, Lead(II), Oxidation, Peat, Pesticides, pH, Removal, Residues, Risk, Solution, Sorption, Temperature, Water

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Full Text: [2008\Env Sci Tec42, 1537.pdf](2008/Env%20Sci%20Tec42,%201537.pdf)

Abstract: The use and risks of agricultural pesticides will continue. It is proposed here that better control and possibly some prevention of environmental and health problems should replace the arbitrary standards and post-event monitoring that are still current practice. Mathematical models have been developed for atrazine in a characterized soil from outside Ottawa, Ontario. Experimental data obtained by the on line HPLC microextraction method were used for the development of the models. The labile sorption sites were treated as a reactant and the number of sites per gram of soil was used to define stoichiometry. This allowed a second-order kinetics integral rate law to be used for sorption from solution onto labile sorption sites, and a first order kinetics integral rate law to be used for bound residue formation. An experimental check and error analyses indicate that the type of model can be used for predictive calculations. The physical meaning of the distribution coefficient K-D is also considered. The model suggests some practical implications for leaching through soil and for transport by storm runoff. The type of model would be best used for providing input data for fate and transport hydrology models.

Keywords: Development, Distribution Coefficient, Environmental, Error, Experimental, First, Health, Kinetics, Law, Leaching, Model, Models, Practice, Prevention, Risks, Soil, Solution, Sorption, Standards, Transport

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Full Text: [2008\Env Sci Tec42, 7970.pdf](2008/Env%20Sci%20Tec42,%207970.pdf)

Abstract: In this study, estimation capacities of response surface methodology (RSM) and artificial neural network (ANN) in a heterogeneous photo-Fenton process were investigated. The zeolite Fe-ZSM5 was used as heterogeneous catalyst of the process for degradation of C.I. Acid Red 14 Azo dye. The efficiency of the process was studied as a function of four independent variables, concentration of the catalyst, molar ratio of initial concentration of H2O2 to that of the dye (H value), initial concentration of the dye and initial pH of the solution. First, a central composite design (CCD) and response surface methodology were used to evaluate simple and combined effects of these parameters and to optimize process efficiency. Satisfactory prediction second-order regression was derived by RSM. Then, the independent parameters were fed as inputs to an artificial neural network while the output of the network was the degradation efficiency of the process. The multilayer feed-forward networks were trained by the sets of input-output patterns using a backpropagation algorithm. Comparable results were achieved for data fitting by using ANN and RSM. In both methods, the dye mineralization process was mainly influenced by pH and the initial concentration of the dye, whereas the other factors showed lower effects.

Keywords: Acid Red 14, Adsorption, Algorithm, Artificial Neural Network, Azo Dye, Bentonite Clay, Catalyst, Composite, Concentration, Data, Decolorization, Degradation, Design, Dye, Efficiency, Function, H2O2, Heterogeneous Catalyst, Hydrogen-Peroxide, Input-Output, Methodology, Methods, Mineralization, Minimization, Modeling, Multilayer, Network, Networks, Neural Network, NOV, Optimization, Oxidation, pH, Photo-Fenton, Prediction, Regression, Response Surface Methodology, Second Order, Second-Order, Solution, Surface, Value, Zeolite

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Full Text: [2008\Env Sci Tec42, 9005.pdf](2008/Env%20Sci%20Tec42,%209005.pdf)

Abstract: Carbon nanotubes (CNTs) have drawn special research attention because of their unique properties and potential applications. This review summarizes the research progress of organic chemical adsorption on CNTs, and will provide useful information for CNT application and risk assessment. Adsorption heterogeneity and hysteresis are two widely recognized features of organic chemical-CNT interactions. However, because different mechanisms may act simultaneously, mainly hydrophobic interactions, pi-pi bonds, electrostatic interactions, and hydrogen bonds, the prediction of organic chemical adsorption on CNTs is not straightforward. The dominant adsorption mechanism is different for different types of organic chemicals (such as polar and nonpolar), thus different models may be needed to predict organic chemical-CNT interaction. Adsorption mechanisms will be better understood by investigating the effects of properties of both CNTs and organic chemicals along with environmental conditions. Another major factor affecting adsorption by CNTs is their suspendability, which also strongly affects their mobility, exposure, and risk in the environment. Therefore, organic chemical-CNT interactions as affected by CNT dispersion and suspending merit further experimental research. In addition, CNTs have potential applications in water treatment due to their adsorption characteristics. Thus column and pilot studies are needed to evaluate their performance and operational cost.

Keywords: Polycyclic Aromatic-Hydrocarbons, Aqueous-Solutions, Noncovalent Functionalization, Polyaromatic Hydrocarbons, Activated Carbon, 1st Step, Sorption, Water, Nanomaterials, Matter

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Full Text: [2009\Env Sci Tec43, 1680.pdf](2009/Env%20Sci%20Tec43,%201680.pdf)

Abstract: The sorption behavior of hydrophobic organic compounds (HOCs) in the environment has been the focus of numerous studies. In most of them, the role of aliphatic domains in sorption has been ignored, even although aliphatic components make up a significant portion of the soil organic matter (SOM). The objective of this review is to elucidate the role of the molecular descriptors - aromaticity and aliphaticity - of natural and engineered sorbents as sorption domains for HOCs in the environment. The data, collected from a large and diverse literature data set show that phenanthrene, like other HOCs, has a strong affinity for aliphatic SOM domains. In many cases, sorption coefficients are higher than those with aromatic-rich sorbents. No significant correlations between either aromaticity or aliphaticity and sorption affinity were recorded for such a large and diverse data set On the basis of the data set from our literature review of natural and engineered sorbents, we conclude that (i) aliphatic structures must be considered in the evaluation of HOC-sorption processes in the environment; (II) neither aromaticity nor aliphaticity of SOM alone can be used to predict the sorption affinity of sorbents having wide and diverse properties; and (iii) these molecular descriptors are valuable for relatively homogeneous and chemically similar sorbents.

Keywords: Black Carbon, C-13 Nmr, Compounds, Data, Distributed Reactivity Model, Environment, Environmental Applications, Evaluation, Hydrophobic, Hydrophobic Organic Compounds, Literature, Literature Review, Nuclear-Magnetic-Resonance, Organic Compounds, Organic Matter, Phenanthrene Sorption, Plant Cuticular Fractions, Processes, Review, Soil, Soil Humic Acids, Solid-State NMR, Sorption, Structural-Characterization

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Full Text: [2009\Env Sci Tec43, 2476.pdf](2009/Env%20Sci%20Tec43,%202476.pdf)

Abstract: Few studies have characterized reactive media for phosphorus (P) removal in passive treatment systems in terms of both batch and continuous flow experiments. This study uses basic oxygen steel slag (BOS) from a U.K. feedstock. Batch experiments demonstrated the effective removal of phosphorus with varying initial pH, initial P concentration, clast size, and ionic strength to represent environmental conditions. Continuous flow column experiments, operated for 406 days, with an influent P concentration of 1-50 mg/L (typical of domestic and dairy parlour waste) achieved removal of up to 62%; a second set of column experiments running for 306 days with an influent P concentration of 100-300 mg/L achieved a maximum effective removal of 8.39 mg/g. This figure is higher than that for other slags reviewed in this study (e.g., EAF Slag 3.93 mg/g and NZ melter slag 1.23 mg/g). XRD, E-SEM, and EDX data provide evidence for a sequential series of increasingly less soluble P mineral phases forming on the BOS surface (octacalcium phosphate, brushite, and hydroxylapatite), which suggests that BOS may be a suitable substrate in passive treatment systems, providing a long-term P removal mechanism.

Keywords: Adsorption, Constructed Wetland Systems, Environmental, ESEM, Fly-Ash, Mechanism, Media, Ph, Phosphate Removal, Reed Beds, Retention, Sands, Steel Slag, Strength, Treatment, Waste, XRD

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Full Text: [2009\Env Sci Tec43, 2537.pdf](2009/Env%20Sci%20Tec43,%202537.pdf)

Abstract: A nanocrystalline Mg/Al layered double hydroxide (FCHT-LDH) adsorbent was developed and investigated through stoichiometric calculations, nitrate displacement investigation, comprehensive sorption/desorption experiments, and analyses with XPS, XRD, FTIR, CHNS/O, and EDX for better understanding of the predominant nature of arsenate (As(V)) interaction with FCHT-LDH. FCHT-LDH demonstrated a higher sorption capacity and a faster sorption rate compared to the layered double hydroxides (LDHs) prepared by conventional methods, due to its higher surface area, better porosity characteristics, and nanocrystalline property. These results also indicated the important role of hydrothermal treatment during the synthesis process for enhanced As(V) removal. The observed nitrate-arsenate molar displacement ratio, increased interlayer spacing, and decreased nitrogen content in the interlayer region revealed the predominance of anion exchange mechanism in As(V) sorption by FCHT-LDH. However, a slight pH increase during As(V) sorption equalization and the presence of ca. 25% irreversibly sorbed As(V) signified the occurrence of ligand exchange process as the secondary sorption mechanism. This specific sorption process that possibly involved formation of inner-sphere As(V) complexes with a monodentate mononuclear configuration at the aluminum center, rendered the FCHT-LDH a high affinity for As(V) over nitrate but induced hysteretic sorption/desorption characteristic that limited its regenerated sorption capacity.

Keywords: Adsorption, Aqueous-Solutions, Equilibrium, Hydrotalcite, Ions, Mechanism, Selenium, Sorption, Water

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Full Text: [2010\Env Sci Tec44, 3508.pdf](2010/Env%20Sci%20Tec44,%203508.pdf)

Abstract: A novel hybrid adsorbent D001-PEI was fabricated for selective Cu(II) removal by immobilizing soluble polyethyleneimine (PEI) nanoclusters within a macroporous cation exchange resin D001. Negligible release of PEI nanoclusters unexpectedly observed during operation may result from the porous cross-linking nature of D-001 as well as the electrostatic attraction between PEI and D001. Increasing solution pH from 1 to 6 results in more favorable Cu(II) retention by D001-PEI, and Cu(II) adsorption onto D001-PEI follows the Langmuir model and the pseudosecond-order kinetic model well. Compared to the host cation exchanger D001, D001-PEI displays more preferable adsorption toward Cu(II) in the presence of competing Mg2+, Ca2+, Sr2+ at greater levels in solution. Fixed-bed adsorption runs showed that Cu(II) sequestration on D001-PEI could result in its conspicuous decrease from 5 mg/L to below 0.01 mg/L. Also, the spent hybrid adsorbent can be readily regenerated by 6-8 BV HCI (0.2 mol/L)-NaCI (0.5 mol/L) binary solution for repeated use with negligible capacity loss. The results reported herein validate that D001-PEI is a promising adsorbent for enhanced removal of Cu(II) and other heavy metals from waste effluents.

Keywords: Adsorbent, Adsorption, Aqueous-Solutions, Biosorbent, Capacity, Cation, Cation Exchange, Cation Exchanger, Crosslinking, Cu(II), Cu(II) Removal, Effluents, Fixed Bed Adsorption, Fixed-Bed, HCI, Heavy Metals, Heavy-Metal Ions, Host, Hybrid, Kinetic, Kinetic Model, Langmuir, Langmuir Model, Macroporous, Membrane, Metals, Methacrylate), Model, Operation, Pei, pH, Pseudosecond-Order, Release, Removal, Resin, Retention, Selective, Sequestration, Silica, Solution, Sorption, Waste, Water

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Full Text: [2010\Env Sci Tec44, 5383.pdf](2010/Env%20Sci%20Tec44,%205383.pdf)

Abstract: The chemical and mineralogical composition of steel slag produced in two ArcelorMittal steel plants located in the North of Spain, as well as the study of the influence of simulated environmental conditions on the properties of the slag stored in disposal areas, was carried out by elemental chemical analysis, XRF, X-ray diffraction, thermal analysis, and scanning electron microscopy with EDS analyzer. Spectroscopic characterization of the slag was also performed by using FTIR spectroscopy. Due to the potential uses of the slag as low cost adsorbent for water treatment and pollutants removal, its detailed textural characterization was carried out by nitrogen adsorption-desorption at 77 K and mercury intrusion porosimetry. The results show that the slag is a crystalline heterogeneous material whose main components are iron oxides, calcium (magnesium) compounds (hydroxide, oxide, silicates, and carbonate), elemental iron, and quartz. The slags are porous materials with specific surface area of 11 m(2)g(-1), containing both mesopores and macropores. Slag exposure to simulated environmental conditions lead to the formation of carbonate phases. Carbonation reduces the leaching of alkaline earth elements as well as the release of the harmful trace elements Cr (VI) and V. Steel slags with high contents of portlandite and calcium silicates are potential raw materials for CO(2) long-term storage.

Keywords: Activated Slag, Adsorption-Desorption, Analysis, Behavior, Blast-Furnace Waste, Calcium, Carbon Slurry, Characterization, CO2 Sequestration, Construction, Eds, Environmental, Exposure, Iron, Lead, Mercury, Microscopy, Plants, Pollutants, Products, Removal, Spain, Steel Slag, Steelmaking Slags, Trace Elements, Treatment, Water, XRF

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Full Text: [2010\Env Sci Tec44, 5564.pdf](2010/Env%20Sci%20Tec44,%205564.pdf)

Abstract: To better understand controls on observed trichloroethene (ICE) reaction rates in granular iron permeable reactive barriers, column experiments were conducted with different iron loadings. Using a reactive transport model and the Kinetic Iron Model (KIM), unique estimates of Langmuir sorption parameters for both the nonreactive and reactive sites, and a rate constant for ICE reduction on the iron surface provides new insights into the character of granular iron that determines overall reactivity. Nonreactive isotherms found in this work compared well with literature isotherms, and it was also found that for TCE and Connelly iron, only about 2% of sorption occurred to reactive sites, in agreement with earlier work by others. Thus, the KIM parameters were found to be relevant and useful under the conditions of these experiments.

Keywords: Batch, Cast-Iron, Chlorinated Ethylenes, CIS-DCE, Columns, Iron, Isotherms, Kinetic, Langmuir, Nitroaromatic Compounds, Sorption, Trichloroethene, Trichloroethylene Reduction, Zero-Valent Iron, Zerovalent Iron

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Full Text: [2010\Env Sci Tec44, 6189.pdf](2010/Env%20Sci%20Tec44,%206189.pdf)

Abstract: Although the major influence of black carbon (BC) on soil and sediment organic contaminant sorption is widely accepted, an understanding of the mechanisms and natural variation in pyrogenic carbon interaction with natural organic matter (NOM) is lacking. The sorption of a phenolic NOM monomer (catechol) and humic acids (HA) onto BC was examined using biochars made from oak, pine, and grass at 250, 400, and 650ºC Catechol sorption equilibrium occurred after 14 d and was described by a diffusion kinetic model, while HA required only 1 d and followed pseudo-second-order kinetics Catechol sorption capacity increased with increasing biochar combustion temperature, from pine < oak < grass and from coarse < fine particle site At lower catechol concentrations, sorption affinity (Freundlich constant, K-f) was directly related to micropore surface area (measured via CO2 sorptometry) indicating the predominance of specific adsorption In contrast, HA exhibited an order of magnitude less sorption (0.1% versus 1%, by weight) due to its exclusion from micropores. Greater sorption of both catechol and HA occurred on biochars with nanopores, i e. biochars made at higher temperatures. These findings suggest that addition of BC to soil, via natural fires or biochar amendments, will sequester abundant native OM through sorption.

Keywords: Activated Carbon, Adsorption, Aromatic-Hydrocarbons, Black Carbon, Capacity, Carbon, Chemicals, CO2, Combustion, Competitive Adsorption, Contaminant, Contaminants, Diffusion, Dissolved Organic-Matter, Equilibrium, Freundlich, Freundlich Constant, Humic Acids, Interaction, Kinetic, Kinetic Model, Kinetics, Mechanisms, Model, Native PAHs, Natural, Nom, Organic, Organic Matter, Polychlorinated-Biphenyls, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second-Order, Pseudo-Second-Order Kinetics, Pyrogenic, Sediment, Sediments, Site, Soil, Soot, Sorption, Sorption Capacity, Specific Adsorption, Surface, Surface Area, Temperature, Understanding

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Full Text: [2010\Env Sci Tec44, 6319.pdf](2010/Env%20Sci%20Tec44,%206319.pdf)

Abstract: Microcystin-RR (MCRR) is among the cyanobacterial toxins of significant concern due to their negative effects on water quality and human health In this study, periphyton dominated by bacteria and diatoms was applied to remove MCRR from water. The maximum removal rate of MCRR by periphyton was observed in the first day (the latent adaptation period). Within this period, 85.2%, 73.3%, 83.5%, and 86.5% of the total MCRR removed (through adsorption and biodegradation) was by the adsorption of periphyton when the periphyton biomasses were 1.32 g, 3 96 g, 6 60 g, and 9 24 g, respectively The amount of MCRR adsorbed increased with the increasing ratio of periphyton biomass to MCRR in solution The adsorption process fitted well to the Freundlich, Langmuir, and Dubinin-Radushkevich (D-R) models, implying that the bioadsorption process has mechanistic relevance The MCRR adsorption by periphyton is physical in nature and thermodynamically spontaneous. This study provided strong evidence that adsorption was the main mechanism for the removal of MCRR and other microcystins by periphyton and similar microbial aggregates in the latent adaptation period Thereafter, biodegradation of periphyton dominated the toxin removal process These results show that periphyton can be employed for an environmentally benign and effective solution for MCRR removal.

Keywords: Activated Carbon, Adaptation, Adsorption, Aggregates, Aqueous-Solution, Bacteria, Biodegradation, Biomass, Degradation, Diatoms, Eric-PCR, Evidence, First, Freundlich, Health, Human, Human Health, Isotherm, Langmuir, Mechanism, Mechanisms, Microbial, Models, Molecularly Imprinted Polymers, Periphyton, Phototrophic Biofilms, Physical, Quality, Relevance, Removal, Sand Filter, Solution, Sorption, Toxin, Water, Water Quality, Water-Quality

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Full Text: [2010\Env Sci Tec44, 6390.pdf](2010/Env%20Sci%20Tec44,%206390.pdf)

Abstract: Copper has been identified as a pollutant of concern by the U.S Environmental Protection Agency (EPA) because of its widespread occurrence and toxic impact in the environment. Three nanoporous sorbents containing chelating diamine functionalities were evaluated for Cu2+ adsorption from natural waters ethylenediamine functionalized self-assembled monolayers on mesoporous supports (EDA-SAMMS), ethylenediamine functionalized activated carbon (AC-CH2-EDA), and 1,10-phenanthroline functionalized mesoporous carbon (Phen-FMC). The pH dependence of Cu2+ sorption, Cu2+ sorption capacities, rates, and selectivity of the sorbents were determined and compared with those of commercial sorbents (Chelex-100 ion-exchange resin and Darco KB-B activated carbon) All three chelating diamine sorbents showed excellent Cu2+ removal (similar to 95-99%) from river water and seawater over the pH range 6.0-8.0 EDA-SAMMS and AC-CH2-EDA demonstrated rapid Cu2+ sorption kinetics (minutes) and good sorption capacities (26 and 17 mg Cu/g sorbent, respectively) in seawater, whereas Phen-FMC had excellent selectivity for Cu2+ over other metal ions le g., Ca2+, Fe2+, Ni2+, and Zn2+) and was able to achieve Cu below the EPA recommended levels for river and sea waters.

Keywords: Activated Carbon, Adsorption, Amine, Aqueous-Solutions, Carbon, Copper, Copper(II), Cu, Cu2+, Disease, Environment, Ethylenediamine, Heavy-Metals, Impact, Ion Exchange, Ion Exchange Resin, Ion-Exchange, Ion-Exchange Resin, Ionexchange, Ions, Kinetics, Mesoporous, Mesoporous Carbon, Metal, Metal Ions, Monolayers, Natural, Ni2+, pH, Rates, Removal, Resin, River, River Water, Seawater, Selectivity, Sorbent, Sorbents, Sorption, Sorption Kinetics, Toxic, Water, Waters, Zn2+

? Miller, A.W., Rodriguez, D.R. and Honeyman, B.D. (2010), Upscaling sorption/desorption processes in reactive transport models to describe metal/radionuclide transport: A critical review. *Environmental Science & Technology*, **44** (21), 7996-8007.

Full Text: [2010\Env Sci Tec44, 7996.pdf](2010/Env%20Sci%20Tec44,%207996.pdf)

Abstract: Models are a mainstay of the environmental sciences; they allow for both deeper understanding of process knowledge and, to a limited extent, predictive capabilities of current day inputs on the future. Mathematical codes have become increasingly complex with explicit inclusion of many processes that could not be accounted for using simpler solving techniques. And yet, for metal/radionuclide transport in subsurface systems, the inclusion of smaller scale processes in a numerical solver do not always lead to better descriptions of larger scale behavior. The reasons for this are many, but included in this review are the following: unknowable conceptual model errors, discrepancy in the scale of model discretization relative to the scale of the chemical/physical process, and omnipresent chemical and physical heterogeneities. Although it is commonly thought that larger, more complex systems require more complex models to gain insight and predictive capability, there is little to no experimental evidence supporting this thought. Indeed, the evidence points to the fact that larger systems can be well described with simple models. To test this thought and to appreciate the incorporation of scaling behaviors into reactive transport modeling, new experiments are needed that are intermediate in scale between the more traditional bench and field scales.

Keywords: Amorphous Iron Oxyhydroxide, Complex, Field, Heterogeneous Porous-Media, Intermediate-Scale, Lead, Model, Modeling, Models, Oxide-Water Interface, Pore-Scale, Process, Processes, Reaction-Rates, Review, Sciences, Solute-Transport, Surface Complexation Models, Transport, Uranium(VI) Sorption, Variable Chemical Conditions

? Coon, J.T., Boddy, K., Stein, K., Whear, R., Barton, J. and Depledge, M.H. (2011), Does participating in physical activity in outdoor natural environments have a greater effect on physical and mental wellbeing than physical activity indoors? A systematic review. *Environmental Science & Technology*, **45** (5), 1761-1772.

Full Text: [2011\Env Sci Tec45, 1761.pdf](2011/Env%20Sci%20Tec45,%201761.pdf)

Abstract: Our objective was to compare the effects on mental and physical wellbeing, health related quality of life and long-term adherence to physical activity, of participation in physical activity in natural environments compared with physical activity indoors. We conducted a systematic review using the following data sources: Medline, Embase, Psychinfo, GreenFILE, SportDISCUS, The Cochrane Library, Science Citation Index Expanded, Social Sciences Citation Index, Arts and Humanities Citation Index, Conference Proceedings Citation Index - Science and BIOSIS from inception to June 2010. Internet searches of relevant Web sites, hand searches of relevant journals, and the reference lists of included papers and other review papers identified in the search were also searched for relevant information. Controlled trials (randomized and nonrandomized) were included. To be eligible trials had to compare the effects of outdoor exercise initiatives with those conducted indoors and report on at least one physical or mental wellbeing outcome in adults or children. Screening of articles for inclusion, data extraction, and quality appraisal were performed by one reviewer and checked by a second with discrepancies resolved by discussion with a third if necessary. Due to the heterogeneity of identified studies a narrative synthesis was performed. Eleven trials (833 adults) were included. Most participants (6 trials; 523 adults) were young students. Study entry criteria and methods were sparsely reported. All interventions consisted of a single episode of walking or running indoors with the same activity at a similar level conducted outdoors on a separate occasion. A total of 13 different outcome measures were used to evaluate the effects of exercise on mental wellbeing, and 4 outcome measures were used to assess attitude to exercise. Most trials (n = 9) showed some improvement in mental wellbeing on one or other of the outcome measures. Compared with exercising indoors, exercising in natural environments was associated with greater feelings of revitalization and positive engagement, decreases in tension, confusion, anger, and depression, and increased energy. However, the results suggested that feelings of calmness may be decreased following outdoor exercise. Participants reported greater enjoyment and satisfaction with outdoor activity and declared a greater intent to repeat the activity at a later date. None of the identified studies measured the effects of physical activity on physical wellbeing or the effect of natural environments on exercise adherence. The hypothesis that there are added beneficial effects to be gained from performing physical activity outdoors in natural environments is very appealing and has generated considerable interest. This review has shown some promising effects on self-reported mental wellbeing immediately following exercise in nature which are not seen following the same exercise indoors. However, the interpretation and extrapolation of these findings is hampered by the poor methodological quality of the available evidence and the heterogeneity of outcome measures employed. The review demonstrates the paucity of high quality evidence on which to base recommendations and reveals an undoubted need for further research in this area. Large, well designed, longer term trials in populations who might benefit most from the potential advantages of outdoor exercise are needed to fully elucidate the effects on mental and physical wellbeing. The influence of these effects on the sustainability of physical activity initiatives also awaitsinvestigation.

Keywords: Adherence, Arts And Humanities Citation Index, Attitude, Children, Citation, Criteria, Data, Depression, Energy, Engagement, Evidence, Exercise, Extraction, Extrapolation, Green Exercise, Health, Heterogeneity, Improvement, Information, Internet, Interventions, Journals, Life, Long Term, Long-Term, Mar, Methods, Natural, Outcome, Outcome Measures, Papers, Participation, Physical, Physical Activity, Populations, Potential, Quality, Quality of, Quality of Life, Randomized, Recommendations, Reference, Reference Lists, Research, Responses, Review, Satisfaction, Science, Science Citation Index, Screening, Sources, Space, Students, Sustainability, Synthesis, Systematic Review, Term

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Full Text: [2011\Env Sci Tec45, 4890.pdf](2011/Env%20Sci%20Tec45,%204890.pdf)

Abstract: Aptamers are a new class of single-stranded DNA/RNA molecules selected from synthetic nucleic acid libraries for molecular recognition. Our group reports a novel aptamer column for the removal of trace (ng/L) pharmaceuticals in drinking water. In this study, cocaine and diclofenac were chosen as model molecules to test the aptamer column which presented high removal capacity, selectivity, and stability. The removal of pharmaceuticals was as high as 88-95%. The data of adsorption were fitted with Langmuir isotherm and a pseudo-second-order kinetic model. A thermodynamic experiment proved the adsorption processes were exothermic in spontaneity. The kinetics of aptamer was composed of three stein: activation, binding, and hybridization. The first step was the rate-controlling step. The adsorption system was divided into three parts: kinetic, mixed, and thermodynamic zones from 0% to 100% binding fraction of aptamer. Furthermore, the aptamer column was reusable and achieved strong removal efficiency from 4 to 30ºC at normal cation ion concentration (5-100 mg/L) for multipollutants Without cross effects and secondary pollution. This work indicates that aptamer, as a new sorbent, can be used in the removal of persistent organic pollutants, biological toxins, and pathogenic bacteria from surface, drinking, and ground water.

Keywords: Acid, Adsorption, Bacteria, Biosensor, Cocaine, DNA Aptamer, Drinking Water, Isotherm, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Isotherm, Ligand-Binding, Liquid-Chromatography, Pharmaceuticals, Recognition, Removal, Resolution, RNA, Selectivity, Sorbent, Thermodynamic, Waste-Water, Water

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Full Text: [2011\Env Sci Tec45, 6181.pdf](2011/Env%20Sci%20Tec45,%206181.pdf)

Abstract: We report on the efficient removal of heavy metal ions from simulated wastewater with a nanostructured assembly. The nanoassembly was obtained via direct assembling the performed anisotropic layered double hydroxide nanocrystals (LDH-NCs) onto the surface of carbon nanospheres (labeled as LDH-NCs@CNs). It was found that the maximum adsorption capacity of the nanoassembly toward Cu2+ was similar to 19.93 mg g-1 when the initial Cu2+ concentration was 10.0 mg L-1, displaying a high efficiency for the removal of heavy metal ions. The Freundlich adsorption isotherm was applicable to describe the removal processes. Kinetics of the Cu2+ removal was found to follow pseudo-second-order rate equation. Furthermore, the as-prepared building unit of the assembly, including LDH-NCs, CNs, and the assembly, as well as Cu2+-adsorbed assembly, were carefully examined by transmission electron microscopy (TEM), Fourier transform infrared spectroscopy (FT-IR), nitrogen sorption measurements, and X-ray photoelectron spectroscopy (XPS). Based on the characterization results, a possible mechanism of Cu2+ removal with the assembly of LDH-NCs@CNs was proposed. Comparison experiments show that the adsorption capacity of the resulting LDH-NCs@CNs assembly was much higher than its any building unit alone (CNs or LDH-NCs), exhibiting the deliberation of the assembly on water decontamination. This work provides a very efficient, fast and convenient approach for exploring promising nanoassembly materials for water treatment.

Keywords: Adsorption, Adsorption Isotherm, Characterization, Cr(VI), Cu2+, Electron Microscopy, Enhancement, Equilibrium, Films, Freundlich, FT-IR, FTIR, Hollow Nanostructures, Isotherm, Kinetics, Mechanism, Nanoparticles, Removal, Sorption, Waste, Wastewater, Water, XPS

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? Huang, C.P. and Hao, O.J. (1989), Removal of some heavy-metals by mordenite. *Environmental Technology*, **10** (10), 863-874.

Full Text: [1989\Env Tec10, 863.pdf](1989/Env%20Tec10,%20863.pdf)

Abstract: Metal removal capability by an aluminosilicate, mordenite, was investigated. Type of metal, pH, and surface loading are the most important factors controlling metal removal by mordinate. The extent of removal follows the order of Pb > Cd > Zn. Ion exchange is the most important mechanism for metal removal by mordenite at pH < 7. In the presence of ligands, metal removal capability is affected by the extent of metal complexation. Hence, there is no effect on metal removal in the presence of equal molar concentration of weak ligand such as glycine. Strong complex former such as EDTA significantly impedes metal removal by mordenite.

Aksu, Z., Sağ, Y. and Kutsal, T. (1990), A comparative study of the adsorption of chromium(VI) ions to *C. Vulgaris* and *Z. Ramigera*. *Environmental Technology*, **11** (1), 33-40.

Full Text: [1990\Env Tec11, 33.pdf](1990/Env%20Tec11,%2033.pdf)

Abstract: The adsorption of chromium(VI) ions to dead cells of Chlorella vulgaris and Zoogloea rssalgera was investigated in this study. Optimum initial pH of the adsorption medium was found as pH 2.0 for both microorganisms. Maximum adsorption rates of metal ions to Cvulgaris and Zramigera were obtained at temperatures ranging from 25 to 50°C. The adsorption rate of metal ion increased by increasing metal ion concentration for Cvulgaris and Zramigera up to 200 and 75 mg 1-1. respectively. Freundlich constants were determined from Freundlich adsorption isotherms of two microorganisms.

Couillard, D. and Tyagi, R.D. (1990), Hydraulic shock loadings of wastewater treatment system to urban rainfall runoff. *Environmental Technology*, **11** (7), 635-650.

Full Text: [1990\Env Tec11, 635.pdf](1990/Env%20Tec11,%20635.pdf)

Abstract: During rain events, run-off waters from urban areas are carried by combined sewer systems towards wastewater treatment facilities. The characteristics of these waters are different from those of usual wastewaters especially concerning flow. The data obtained during the sampling programme compared with the knowledge found in the literature review lead to the conclusion that the variations in flow and concentrations of nutrients measured during the sampling period would not have caused any important changes in the operation of a biological wastewater treatment system.

Aksu, Z. and Kutsal, T. (1990), A comparative study for biosorption characteristics of heavy metal ions with *C. Vulgaris*. *Environmental Technology*, **11** (10), 979-987.

Full Text: [1990\Env Tec11, 979.pdf](1990/Env%20Tec11,%20979.pdf)

Abstract: The kinetics of biosorption of Cu(II), Zn(II), Fe(II), Cr(VI), and Pb(II) ions existing in waste water to Chlorella vulgaris, a green alga was investigated in a stirred batch reactor. In adsorption studies of afore said metal ions, optimum adsorption temperatures and initial pH values for each ion were determined as 25°C, 55°C. 25-35°C, 35-50°C. 55°C. and pH 4.0-4.5. 4.0-4.5, 1.0-2.0, 1.5-2.0, 5.0, respectively. Initial metal ion concentrations of 200 ppm gave the highest adsorption rates for most of the metal ions. Corresponding Freundlich adsorption constants and adsorption degrees were found from Freundlich adsorption isotherms which were constituted at 25°C.

Aksu, Z., Kutsal, T., Gün, S., Hacíosmanoğlu, N. and Gholaminejad, M. (1991), Investigation of biosorption of Cu(II), Ni(II) and Cr(VI) ions to activated sludge bacteria. *Environmental Technology*, **12** (10), 915-921.

Full Text: [1991\Env Tec12, 915.pdf](1991/Env%20Tec12,%20915.pdf)

Abstract: In this study, the adsorption of Cu(II), Ni(II), and Cr(VI) ions to activated sludge bacteria obtained from the waste water system of METEKSAN, Turkey was investigated. Optimum adsorption temperatures and pH values of each ion were determined as 25°C, 35°C, 45°C, and as pH 5.0, 5.0, and 1.0, respectively. Initial metal ion concentrations of 150-200 ppm gave the highest initial adsorption rates for all metal ions. Corresponding Freundlich adsorption constants and adsorption degrees were found from the Freundlich adsorption isotherms which were constituted at 25°C.

Keywords: Vulgaris

Cotoras, D., Viendma, P., Cifuentes, L. and Mester, A. (1992), Sorption of metal ions by whole cells of bacillus and micrococcus. *Environmental Technology*, **13** (6), 551-559.

Full Text: [1992\Env Tec13, 551.pdf](1992/Env%20Tec13,%20551.pdf)

Abstract: Metal removal by seven strains of Bacillus and Micrococcus was investigated. The culture age of the cells had little or no effect on their sorption capacity. Using the Langmuir isotherm, it was possible to determine that Bacillus subtilis ATCC 6633 had the highest maximum sorption capacity for uranium while a Micrococcus sp. strain presented the highest affinity. pH of the solution affected the sorption of uranium, copper, cadmium and zinc by B. subtilis. Hydrochloric acid was effective for desorption of uranium from pre-loaded biomass. The presence of other ion inhibited uranium sorption in the following order: Cu2+>Zn2+>Mg2+>Cd2+>Ca2+>K+.

Keywords: Bacillus, Micrococcus, Sorption, Metals, Uranium, Heavy-Metals, *Zoogloea-Ramigera*, Extracellular Polysaccharide, Accumulation, Subtilis, Wall, Biosorbents, Adsorption, Uranium

Aksu, Z., Sağ, Y. and Kutsal, T. (1992), The biosorption of copper(II) by *C. Vulgaris* and *Z. Ramigera*. *Environmental Technology*, **13** (6), 579-586.

Full Text: [1992\Env Tec13, 579.pdf](1992/Env%20Tec13,%20579.pdf)

Abstract: The adsorption of copper(II) ions to dead cells of *Chlorella vulgaris* and *Zoogloea Ramigera* was investigated. Optimum initial pH of the adsorption medium was found to be 4.0-4.5 for both microorganisms. In general, higher adsorptive uptake was observed at 25°C. The initial adsorption rate of metal ion increased by increasing metal ion concentration for *C. Vulgaris* and *Z. Ramigera* up to 150-200 mgl-1 and 100-125 mgl-1, respectively. Freundlich constants were determined from the Freundlich adsorption isotherms of two microorganisms.

Keywords: Ions, Waste-Water, Biosorption, Heavy Metal, Microorganism, Isotherms

? Montiel, A. and Welte, B. (1992), Alternatives to atrazine: Cyanazine and methods of removal. *Environmental Technology*, **13** (8), 719-725.

Full Text: [1992\Env Tec13, 719.pdf](1992/Env%20Tec13,%20719.pdf)

Abstract: Atrazine is a pesticide frequently encountered in ground and surface waters. The maximum allowable concentration of this pesticide in France is 0.1 μg 1-1 and levels of atrazine often are over this limit. Researches are being conducted actually to treat this polluant or to find new molecules in replacement. Cyanazine has been proposed and we have tested the efficiency of differents treatments on a pilot plant. Coagulation - floculation is ineffective. Ozonation seems not very effective but slow sand filtration seems better to remove this herbicide. The explanation of elimination of cyanazine on slow sand filters seems to be adsorption followed by rapid biodegradation. The step of reversible adsorption may conduct to high concentration of cyanazine in water flowing out the slow sand filter in case of brutal change of concentration in raw water.

Keywords: Pesticide, Atrazine, Cyanazine, Water Treatment, Contamination, Pesticides

? Zhou, J.L. and Banks, C.J. (1992), Humic acid removal from water by biosorption. *Environmental Technology*, **13** (8), 727-737.

Full Text: [1992\Env Tec13, 727.pdf](1992/Env%20Tec13,%20727.pdf)

Abstract: The adsorption of humic acid by *Rhizopus arrhizus* obeyed the Freundlich equation describing heterogeneous surface energy adsorption, and was shown to be pH and biomass concentration dependent. The fungal cell wall chitin/chitosan component had the highest adsorption capacity, followed by cell wall, whole cell then protoplast. The effects of culture age, growth medium composition and biomass pre-treatment with NaOH were assessed in relation to adsorption efficiency and capacity. The presence of metal ions in solution increased humic acid removal by R.arrhizus, this was explained by the role of ions in bridging cell wall surface charge to humic acid surface charge.

Keywords: Humic Acid, Adsorption, Fungal Biomass, Biosorption, Chitin Chitosan, Activated Carbon Adsorption, Molecular-Weight, Drinking-Water, Substances, Chlorination, Polydispersity, Heterogeneity, Calcium

Gupta, G.S., Shukla, S.P., Prasad, G. and Singh, V.N. (1992), China clay as an adsorbent for dye house wastewaters. *Environmental Technology*, **13** (10), 925-936.

Full Text: [1992\Env Tec13, 925.pdf](1992/Env%20Tec13,%20925.pdf)

Abstract: The ability of china clay to remove a popular chrome dye, Omega Chrome Red ME, from aqueous solutions has been studied. Maximum removal (i.e., 81.08%) was noted at 10 mg l-1 initial dye concentration, 53μm adsorbent particle size, 2.0 pH and 303 K. The process follows a first order rate kinetics. Intraparticle diffusion and mass transfer coefficients have been determined at different temperatures. The adsorption data fits well in the Langmuir adsorption model. The effect of temperature has been examined on the basis of boundary layer thickness and enthalpy change studies. Heat of adsorption has been found to be a function of surface coverage. The maximum removal of the dye in acidic range has been explained on the basis of surface hydroxylation, acid-base dissociation and surface complexation probabilities. A 100% desorption of the dye from the adsorbent surface was noted at pH 12.0.

Keywords: Chrome Dye, China Clay, Adsorption, Waste-Water, Desorption, Aqueous-Solutions, Activated Carbon, Chrome Dye, Removal, Adsorption, Color, Equilibrium, Dyestuffs, Effluents, Silica

Mansouri, E., Potin-Gautier, M., Castetbon, A. and Astruc, M. (1992), Determination of the copper complexing capacity of dilute aqueous solutions of humic acids by D.P.A.S.V. titration in acetate buffers. *Environmental Technology*, **13** (10), 969-978.

Full Text: [1992\Env Tec13, 969.pdf](1992/Env%20Tec13,%20969.pdf)

Abstract: D.P.A.S.V. evaluation of the complexing capacity of aqueous solutions of humic acids by copper titration has been studied in non complexing solutions and in acetate buffers. Some difficulties have been evidenced due to the necessity of controlling pH and interferences from the buffers. A method using dilute buffer solutions and a semi empirical integration of the voltamperometric peaks is proposed.

Keywords: Dpasv, Complexing Capacity, Fresh Waters, Acetate Buffer, Copper, Humic Acids, Differential Pulse Polarography, Natural-Waters, Speciation, Complexation, Lead

? Petruzzelli, G., Petronio, B.M., Gennaro, M.C., Vanni, A., Lubrano, L. and Liberatori, A. (1992), Effect of a sewage sludge extract on the sorption process of cadmium and nickel by soil. *Environmental Technology*, **13** (11), 1023-1032.

Full Text: [1992\Env Tec13, 1023.pdf](1992/Env%20Tec13,%201023.pdf)

Abstract: Studies about heavy metals interactions with soils have received increasing attention due to land addition of different kinds of sewage sludge. Of particular importance in this field is the sorption process of heavy metals which influences their mobility, determining their distribution between the liquid and the solid phase of the soil. In this work, heavy metals (Ni and Cd) sorption was carried out on a sandy-loam soil with and without a sewage sludge extract (CO2-H2O solution at pH 3.8) to evaluate the effects of ligand species present in the sludge in the process of retaining heavy metals. The addition of sewage sludge extract, did not reduced the sorption, but rather increased the amount of heavy metals retained by the soil. The effect could be ascribable, at the pH of the experiment, to a preliminary sorption of organic ligands on to soil with the creation of new sorbing surfaces. The sewage sludge extract was, then characterized by elemental analysis, thermogravimetric, NMR and IR techniques to deepen the knowledge of the interactions with soil.

Keywords: Heavy Metals, Soil, Sorption, Sewage Sludge, Analytical Characterization, Adsorption, Zinc

Miller, C.E. and Lewis, R.H. (1992), The reproducibility of field measurements of urban air pollution: A pragmatic approach. *Environmental Technology*, **13** (11), 1053-1060.

Full Text: [1992\Env Tec13, 1053.pdf](1992/Env%20Tec13,%201053.pdf)

Abstract: Four series of field measurements of total suspended particulates and lead, using a pair of Warren Spring M-type samplers, were conducted at a site in a large urban centre. The differences between the data generated by the two samplers were analysed in order to estimate the contributions, from experimental error and from inherent variations in the collected samples, to the overall variance. The implications of these relative contributions for the realisation of reproducible field experiments on air pollution are discussed.

Keywords: Reproducibility, Experimental Error, Sample Variance, Lead, Particulates

Saucedo, I., Guibal, E., Roulph, Ch. and Le Cloirec, P. (1992), Sorption of uranyl ions by a modified chitosan: Kinetic and equilibrium studies. *Environmental Technology*, **13** (12), 1101-1115.

Full Text: [E\Env Tec13, 1101.pdf](E/Env%20Tec13,%201101.pdf)

Abstract: The uranium sorption of an ascorbic chitosan derivative polymer (N.D.T.C. N-[2-(1,2-dihydroxyethyl) tetra-hydrofuryl] chitosan) was shown to be three to four times greater than chitosan under the same conditions, reaching 600 mgU.g-1 polymer (i.e. 2.5 mmolU.g-1 polymer). The effect of variation of the classic parameters was studied: pH, metal concentration and particle size. pH and metal concentration, which induced a change in metal solution chemistry, were found to be the controlling parameters, mainly affecting intraparticle diffusion, the diffusion rate is strongly affected by ionic size of solute, as opposed to a limited effect on external mass transfer. pH plays an important part in equilibrium studies, and sorption isotherms are mainly a function of pH. The Freundlich model shows a better correlation coefficient than the Langmuir modal when fitted to experimental results, the uptake mechanism involves a monolayer sorption with molecular interactions between molecules sorbed on surface.

Keywords: Adsorption, Ascorbic-Acid, Chitosan, Concentration, Correlation, Diffusion, Equilibrium, Functional Polymers, Highly Phosphorylated Derivatives, Interactions, Isotherms, Mass Transfer, Mechanism, Metal, Model, Modified Chitosan, Parameters, Partially Deacetylated Chitin, Particle, Particle Size, pH, Polymer, Removal, Sorbed, Sorption, Sorption Isotherms, Uptake, Uranium

? Li, C.Y. and Voudrias, E.A. (1993), Effect of organic carbon on the uptake of benzene vapor by soil. *Environmental Technology*, **14** (2), 189-194.

Full Text: [1993\Env Tec14, 189.pdf](1993/Env%20Tec14,%20189.pdf)

Abstract: Batch experiments were conducted to determine the uptake of benzene vapor by soils with different organic carbon content (foc), under benzene vapor concentration equal to that of vapor pressure. The time required to reach equilibrium increased with increasing f(oc) and the sorbed equilibrium concentrations (qobs) were 0.44±0.2, 7.1±0.6, 12.3±0.8, 14.8±1.2, and 25.2±1.8 mg g-1 for sand and soils with f(oc) of 0.39%. 1.54%, 2.09%, and 4.15%, respectively. Vapor uptake due to mono-layer surface coverage (qm) was less than 4% of qobs. The difference qobs-qm normalized with respect to foc was several orders of magnitude higher than 20.2 mg g-1 reported for benzene vapor partitioning into soil humic acid, indicating that benzene uptake at saturated vapor pressure was mostly due to condensation rather than partitioning or monolayer sorption. These data would be applicable to soil in close proximity to liquid benzene, such as a spill or a leak.

Keywords: Sorption, Benzene Vapor, Saturated Pressure, Organic Carbon, Sorption, Trichloroethylene

? Tan, W.T., Ooi, S.T. and Lee, C.K. (1993), Removal of chromium(VI) from solution by coconut husk and palm pressed fibers. *Environmental Technology*, **14** (3), 277-282.

Full Text: [1993\Env Tec14, 277.pdf](1993/Env%20Tec14,%20277.pdf)

Abstract: Removal of chromium(VI) from aqueous solutions by coconut husk fibres (CHF) and palm pressed fibres (PPF) was investigated using batch and column techniques. Batch tests showed that pH range for effective Cr(VI) removal was between 1.5 and 5 for CHF and between 1.5 and 3 for PPF. The adsorption capacities of CHF and PPF were estimated to be 29 and 14 mg Cr g-1 substrate at pH 2.0. In column studies, breakthrough curves of various columns containing PPF were obtained for various flow rates and bed-depths and the results were compared with Hutchin’s model for adsorption column (1). The results of breakthrough curves of various columns containing mixed media of CHF or PPF in soil system demonstrated that both substrate could also be used as barriers in the landfill to maximize immobilization of toxic metal such as Cr(VI) in leachates.

Keywords: Batch, Column, BDST, Fixed and Mixed Beds, Activated-Carbon, Adsorption

Majone, M., Papini, M.P. and Rolle, E. (1993), Clay adsorption of lead from landfill leachate. *Environmental Technology*, **14** (7), 629-638.

Full Text: [1993\Env Tec14, 629.pdf](1993/Env%20Tec14,%20629.pdf)

Abstract: This paper examines clay adsorption of lead from leachates originating in controlled landfills for municipal solid wastes. Special attention has been given to determining the extent to which Freundlich and Langmuir-derived isotherms may represent the system in various experimental conditions (metal concentration and pH). Lead adsorption is satisfactory described at constant pH by using the Langmuir/Freundlich isotherm over the entire pH range examined (4.0-8.5). By using theoretical speciation, adsorption related to free Pb (Pb2+) in solution makes the results more generalizable than in terms of total Pb. Theoretical speciation also allows for interpreting the pH effect on adsorption: as pH increases, adsorption of free Pb increases but at the same time free Pb decreases. Depending on which effect is prevailing, adsorption at a fixed total Pb concentration can increase or decrease, as pH changes. As an environmental implication, an increase of pH does not always entail stronger attenuation of pollutants by soil adsorption.

Keywords: Clay, Adsorption, Landfill, Leachate, Wastes, Cadmium Soil Sorption, Parameters

? Nakhla, G.F. and Alharazin, J.M. (1993), Simplified analysis of biodegradation kinetics of phenolic compounds by heterogeneous cultures. *Environmental Technology*, **14** (8), 751-760.

Full Text: [1993\Env Tec14, 751.pdf](1993/Env%20Tec14,%20751.pdf)

Abstract: A simplified approach to the determination of biokinetic parameters for phenol and ortho-cresol degradation by heterogeneous microbial cultures, which involved a modified kinetic model and inoculating acclimated microbial cultures with low substrate concentrations, was undertaken. The growth rate data for the two compounds conformed to the Monod model with the maximum specific growth rate, mu(max) and the half-saturation concentration, K(s), for phenol ranging from 0.44 to 3.3 days-1 and from 5.9 to 18 mg l-1 respectively. The corresponding values for o-cresol were 0.7 to 2.0 days-1 and 9.3 to 40.7 mg l-1. The bacterial yield coefficients for phenol and o-cresol were 0.53 and 0.60 mg VSS (mg substrate) -1, respectively with corresponding decay rates of 0.16 and 0.13 days-1. The simplified approach yielded results that are comparable to those of more sophisticated experimental and mathematical techniques.

Keywords: Biodegradation, Kinetics, Phenolic Compounds, Heterogeneous Cultures, Sequencing Batch Reactors, Sequencing Batch Reactors, Waste-Water, Inhibition

? Kim, N.D. and Hill, S.J. (1993), Sorption of lead and thallium on borosilicate glass and polypropylene: Implications for analytical chemistry and soil science. *Environmental Technology*, **14** (11), 1015-1026.

Full Text: [1993\Env Tec14, 1015.pdf](1993/Env%20Tec14,%201015.pdf)

Abstract: Adsorption of 10-100 ppb lead and thallium by borosilicate glass and polypropylene surfaces was studied. No thallium was adsorbed by either substrate at pH 7.0. About 50-60% of the lead was adsorbed by borosilicate glass at pH 5.5 and pH 7.0, witb statistically indistinguishable conditional equilibrium constants (K(D)\* values) of 1.47±0.40 mL cm-2 and 1.80±0.11 mL cm-2, respectively. Polypropylene adsorbed significantly more lead than borosilicate glass at pH 7.0 (80.9%, K(D)\* = 5.33±0.45 mL cm-2), and substantially less at pH 5.5 (16.7%, K(D)\* = 0.27±0.03 mL cm-2), indicating a fundamental change in the nature of the polypropylene surface. All adsorption data fitted Freundlich plots. Preliminary experiments indicate that at pH 5.5, a fraction of the lead sequestered by the borosilicate glass may be bound irreversibly by migrating into the glass matrix. The results suggest that tectosilicates and silicate glasses may represent important adsorbents of some heavy metals in soils, despite showing very low intrinsic cation exchange capacities.

Keywords: Lead, Thallium, Adsorption, Borosilicate Glass, Polypropylene, Trace-Metals, Adsorption, Cadmium, Speciation, Sediments, Surface, pH

Low, K.S., Lee, C.K. and Heng, L.L. (1994), Sorption of basic dyes by *Hydrilla verticillata*. *Environmental Technology*, **15** (2), 115-124.

Full Text: [1994\Env Tec15, 115.pdf](1994/Env%20Tec15,%20115.pdf)

Abstract: The potential of an aquatic plant, *Hydrilla verticillata*, to remove two basic dyes, Methylene Blue and basic blue, from aqueous solutions was assessed under various experimental conditions. Results showed that dried Hydrilla was able to remove the dyes efficiently and rapidly. Its breakthrough time under flow conditions could be predicted using Hutchin’s bed depth-service time (BDST) model. As Hydrilla is readily available, it could represent a cheap source of biosorbent for basic dyes.

Keywords: Basic Dyes, Sorption Characteristics, Hydrilla-Verticillata, Activated-Carbon

? Alberga, L., Holm, T., Tiravanti, G. and Petruzzelli, D. (1994), Electrochemical determination of cadmium sorption on kaolinite. *Environmental Technology*, **15** (3), 245-254.

Full Text: [1994\Env Tec15, 245.pdf](1994/Env%20Tec15,%20245.pdf)

Abstract: Two alternative methods, based on voltammetric (OSWSV, Osteryoung Square Wave Stripping Voltammetry, OSWV, Osteryoung Square Wave Voltammetry) and potentiometric (ISE, Ion Selective Electrode), are proposed for the determination of adsorption isotherms of metals in natural porous systems (soils, subsoils). The main advantage of the reference techniques is that filtration step, of the classical ‘‘batch equilibration method’’ for liquid-solid separation, can be skipped and metal equilibrium concentration determined directly in the suspension without relevant problems. Some limitation are evidenced during the experiments: pH dependence of the electrode response for the potentiometric determinations and reproducibility of the measures at very low concentrations (less-than-or-equal-to 100 μg L-1) for voltammetric methods. The computer code MINTEQA2 was used to simulate solid-liquid phase equilibria of the cadmium-kaolinite systems for the interpretation of the interactive phenomena. A combination of the ion exchange and surface complexation models was adopted for data interpretation.

Keywords: Equilibrium Isotherms, Liquid-Solid Interface, Voltammetry, Cadmium, Kaolinite, Water Interface, Adsorption, Partition

Srivastava, S.K., Singh, A.K. and Sharma, A. (1994), Studies on the uptake of lead and zinc by lignin obtained from black liquor: A paper industry waste material. *Environmental Technology*, **15** (4), 353-361.

Full Text: [1994\Env Tec15, 353.pdf](1994/Env%20Tec15,%20353.pdf)

Abstract: Lignin extracted from black liquor-a paper industry waste material, has been characterized and used for the removal of lead and zinc metals. The uptake of lead is found to be greater than the uptake of zinc, and the sorption capacity increases with increasing pH. Adsorption on lignin follows the Freundlich and Langmuir models. Isotherms have been used to obtain the thermodynamic parameters of the process. Several polyhydric phenols and other substituted analogues may be involved in the uptake of metal ions. In comparison to other low-cost adsorbents, the sorption capacity of the material, under investigation is found to be significantly high for the two metal ions.

Keywords: Lignin, Adsorbent, Lead, Zinc, Adsorption, Toxic Metal-Ions, Aqueous-Solutions, Activated Carbon, Removal, Adsorption, Cadmium, Water, Adsorbents

Brady, D., Stoll, A. and Duncan, J.R. (1994), Biosorption of heavy metal cations by non-viable yeast biomass. *Environmental Technology*, **15** (5), 429-438.

Full Text: [1994\Env Tec15, 429.pdf](1994/Env%20Tec15,%20429.pdf)

Abstract: Granular biosorbent biomass was produced by treating yeast with hot alkali. The granular biomass was capable of accumulating a wide range of heavy metal cations (Fe3+, Cu2+, Cr3+, Hg2+, Pb2+, Cd2+, Co2+, Ag+, Ni2+, and Fe2+) but not an anion (Cr2O72-) or an alkaline-earth metal (Ca2+). Accumulation within the heavy metal group was selective (Cu2+ > Cr3+ > Cd2+ and Cu2+ > Pb2+ > Ni2+). Biosorption to the granular biomass was rapid. Although the biomass was capable of removing > 99% of zinc, chromium and copper from electroplating wastewater, it was only capable of removing 50-60% of chromium from tannery wastewater.

Keywords: Biosorbents, Metals, Biosorption, Nonviable, Yeast, *Rhizopus-arrhizus*, Aqueous-Solutions, Mechanism, Recovery, Removal, Ions, Biosorbents, Water

Özer, D., Aksu, Z., Kutsal, T. and Çaglar, A. (1994), Adsorption isotherms of lead(II) and chromium(VI) on *Cladophora crispata*. *Environmental Technology*, **15** (5), 439-448.

Full Text: [1994\Env Tec15, 439.pdf](1994/Env%20Tec15,%20439.pdf)

Abstract: The biosorption of heavy metal ions by algae is a promising property with a potential for industrial use. The adsorption of lead(II) and chromium(VI) ions on *Cladophora crispata*, a green algae, was studied with respect to adsorption pH and temperature in order to determine the optimum conditions for lead(II) and chromium(VI) removal, which were found to be pH 5.0, 25-degrees-C and pH 1.0, 25-degrees-C, respectively. The adsorption isotherms were developed and it was seen that the adsorption equilibrium data fit both Freundlich and Langmuir isotherms within the studied metal ion concentrations. The adsorption constants for lead were much higher than those for chromium for both Langmuir and Freundlich models.

Keywords: Adsorption Isotherms, Lead(II), Chromium(VI), *C. Crispata*, *Alga Chlorella-Vulgaris*, *C. Vulgaris*, *Z. Ramigera*, Biosorption, Copper(II), Cadmium, Zinc

Fass, S., Ganaye, V., Urbain, V., Manem, J. and Block, J.C. (1994), Volatile fatty acids as organic carbon sources in denitrification. *Environmental Technology*, **15** (5), 459-467.

Full Text: [1994\Env Tec15, 459.pdf](1994/Env%20Tec15,%20459.pdf)

Abstract: We have evaluated the possibilities of waste water denitrification using volatile fatty acids (VFA) as the sole carbon and electron source in an activated sludge culture continuously fed with a mixture of acetate, propionate, butyrate and valerate. All the VFA were biodegraded in denitrification conditions by a mixed adapted bacterial population with 5 predominant different bacterial strains (Ochrobactrum anthropi, Moraxella lacunata, *Pseudomonas* testosteroni, Paracoccus denitrificans, and Pasteurella gr. EF4). The denitrification (20 mg N-NO(x) g-1 MES h-1) and carbon consumption rates (60 mg C g-1 MES h-1) obtained in batch conditions were the same for acetate, butyrate, valerate used alone or for a mixture of the 4. Propionate was almost not metabolized (3 mg N-NO(x) g-1 MES h-1 and 8 mg C g-1 MES h-1).

Keywords: Denitrification, Volatile Fatty Acids, Batch Test, Mixed Bacterial Population, Acetate, Denitrifying Bacteria, *Pseudomonas-Nautica*, Reduction, Nitrate, Nitrite, Growth, Oxygen, Soil

? Fernandez, N. and Forster, C.F. (1994), An evaluation of the options for secondary treatment of effluents produced from the anaerobic digestion of simulated coffee wastewaters. *Environmental Technology*, **15** (5), 485-490.

Full Text: [1994\Env Tec15, 485.pdf](1994/Env%20Tec15,%20485.pdf)

Abstract: A synthetic wastewater, which was based on an extract of ground coffee and which simulated the trade effluent produced during the manufacture of instant coffee, can be treated by anaerobic digestion (at both mesophilic and thermophilic temperatures). However, the effluents from both digesters were strongly coloured and had a significant COD. This paper examines the secondary treatment of these effluents by aerobic bio-oxidation, by coagulation/flocculation with aluminium sulphate and by adsorption with granular activated carbon. Only activated carbon was successful. The paper also reports the analysis of both batch and continuous adsorption studies. This showed that the Langmuir isotherm capacity was 0.91 mg COD mg-1 and that the breakpoint (taken as 125 mg COD l-1) for the effluent from the thermophilic filter occurred at a lower volume than for the mesophilic effluent.

Keywords: Secondary Treatment, Anaerobic Digestion, Activated Carbon, Gas-Liquid-Chromatography, Adsorption

Mavros, P., Danilidou, A.C., Lazaridis, N.K. and Stergiou, L. (1994), Color removal from aqueous solutions. Part I. Flotation. *Environmental Technology*, **15** (7), 601-616.

Full Text: [1994\Env Tec15, 601.pdf](1994/Env%20Tec15,%20601.pdf)

Abstract: The removal of colours from aqueous solutions and/or dispersions has been studied by dispersed-air flotation, in a semi-batch flotation column. Three colours were used for the experiments: Basic Yellow 28 (acidic), Direct Black 22 (basic) and Disperse Orange 30 (dispersion colour). All three were effectively removed by flotation within 15 to 30 min. Sodium lauryl sulfate and dodecylamine were found to be effective as collectors in the removal of colour, which was also found to be related to the pH of the solution and the amount of collector added to it, with high collector dosages causing the process to become pH-independent.

Keywords: Flotation, Flotation Column, Color Flotation, Dodecylamine, Sodium Lauryl Sulfate, Adsorbing Colloid Flotation, Solvent Sublation, Waste-Water, Aeration, Blue, Red

Bouhamra, W.S. and Jassem, F.M. (1994), Estimation of the mass transfer coefficients and diffusion coefficients of nickel and vanadium in Kuwait crude oils: Prediction of long term leaching under simple experimental conditions. *Environmental Technology*, **15** (7), 645-656.

Full Text: [1994\Env Tec15, 645.pdf](1994/Env%20Tec15,%20645.pdf)

Abstract: One of the major concerns following the Iraqi invasion is the possibility of ground water contamination caused due to massive oil spillage. Nickel and vanadium are the major metals which exist in trace amounts in crude oils. Leaching of nickel and vanadium was studied on a laboratory scale using four different crude oils, Kuwait export (KE), Burgan (B), Ratawi (R) and Weathered (W). Nitric, sulphuric and acetic acids (pH 4 and 6) were the leaching medium. The rate of leaching was found to be significantly dependent on the type of crude and the pH value of the leaching medium. The values for the mass transfer coefficient of nickel and vanadium are in the range 0.3-3.18×10-3 cm3min-1 and 0.04-6.4×10-3 cm3min-1. The diffusion coefficient values for nickel and vanadium are in the range 0.17-22.2×10-9 cm2day-1 and 0.06-45.4×10-7 cm2day-1. An overall study of these values suggest that nitric acid is the most effective leachant for both metals in the four crude oils. Time for 10% leaching of nickel and vanadium in the oils is estimated. A novel feature stemming from this study is the values for the rate for 10% leaching. The time required for the leaching of 10% nickel and vanadium ranged from 2-17.2×10 years and 4-54.6×10 years respectively. Analysis of variance (ANOVA) of different experimental parameters are presented. The confidence interval for the concentration of nickel and vanadium was estimated. Parameters like the type of acid, pH value of the acid and the type of crude was considered. The ANOVA tests indicated that the leaching ability of the acids varied with the type of crude. The tests showed that there exists a relationship between the initial pH value of the acid and the metal concentration. Better leaching results were obtained with acids having pH 4.

Keywords: Leaching Process, Mass Transfer Coefficient, Diffusion Coefficient, Elution, Soil Contamination, Soil

Pedroso, A.C.S., Gomes, L.E.R. and Carvalho, J.M.R.de. (1994), Mercury removal from process sludges via hypochlorite leaching. *Environmental Technology*, **15** (7), 657-667.

? Correia, V.M., Stephenson, T. and Judd, S.J. (1994), Characterization of textile wastewaters: A review. *Environmental Technology*, **15** (10), 917-929.

Full Text: [1994\Env Tec15, 917.pdf](1994/Env%20Tec15,%20917.pdf)

Abstract: The characteristics of wastewater from textile processing operations are comprehensively reviewed. The categorisation of wastewaters proceeds through a consideration of the nature of the various industrial processes employed by the industry and the chemicals associated with these operations. Chemical pollutants arise both from the raw material itself and a broad range of additives used to produce the finished product. The industrial categories considered include sizing and desizing, weaving, scouring, bleaching, mercerizing, carbonizing, fulling, dyeing and finishing. Pollutants of concern range from non-biodegradable highly-coloured organic dyes to pesticides from special finishes such as insect-proofing. It is evident that the textile wastewater chemical composition is subject to considerable change due to both the diversity in the textile processes employed and the range of chemicals employed within each industrial category.

Keywords: Textile Waste-Water, Textile Processes, Dyehouse Effluents, Membrane

? Mesquita, M.E., Silva, J.M.V. and Domingues, H. (1994), Copper adsorption by a schistic soil: Application of sewage sludge. *Environmental Technology*, **15** (11), 1089-1094.

Full Text: [1994\Env Tec15, 1089.pdf](1994/Env%20Tec15,%201089.pdf)

Abstract: Copper adsorption on a schistic soil and its distribution in soil fractions were studied. Copper was added either as the nitrate salt or in sewage sludge. Adsorption data fitted the Langmuir adsorption isotherm. Desorbed copper was represented by a Freundlich isotherm. In soil samples incubated with sludge, only a small amount of copper was adsorbed by the soil. In sludge and incubated soil samples the metal was adsorbed on the manganese oxides. Most of the copper from sludge was specifically adsorbed and only small amounts were transferred to the soil.

Keywords: Adsorption, Copper, Sewage Sludge, Isotherms, Sequential Extraction, Zinc, Sorption, Cadmium, Metals, Acid, Lead, pH.

Low, K.S. and Lee, C.K. (1995), Chrome waste as sorbent for the removal of arsenic(V) from aqueous solution. *Environmental Technology*, **16** (1), 65-71.

Full Text: [E\Env Tec16, 65.pdf](E/Env%20Tec16,%2065.pdf)

Abstract: The present study investigates the potential of chrome sludge, a waste material from electroplating industry, as a sorbent for the removal of As(V) from aqueous solution. Parameters studied include sorbent dosages, temperatures, different initial concentrations and pH values. The sorption of As(V) was rapid and the process of uptake follows the Langmuir isotherm model. Maximum sorption capacity of chrome sludge for As(V) was found to be 21 mgg-1.

Keywords: Arsenic(V), Sorption Characteristics, Chrome Sludge, Activated Carbon, Water

Petronio, B.M., D’Orazio, D., Petruzzelli, G., Gennaro, M.C., Vanni, A. and Liberatori, A. (1995), Sorption capacities of soil: Effect of organic compounds. *Environmental Technology*, **16** (1), 81-88.

Full Text: [E\Env Tec16, 81.pdf](E/Env%20Tec16,%2081.pdf)

Abstract: The interactions between the liquid phase of sewage sludge and soil have been investigated. The chromatographic aspects (retention volumes and dynamic capacities) have been studied by breakthrough curves of copper on soil not treated and those treated with the liquid phase. The nature of the organic compounds retained by soil during the adsorption processes have been characterized using selected analytical techniques. The breakthrough curves are remarkably influenced by organic compounds -soil interactions. The specific retention volume depends on the nature of the organic matter adsorbed.

Keywords: Breakthrough Curves, Soil, Sludge, Organic Compounds, Sludge

Guibal, E., Lorenzelli, R., Vincent, T. and Le Cloirec, P. (1995), Application of silica gel to metal ion sorption: Static and dynamic removal of uranyl ions. *Environmental Technology*, **16** (2), 101-114.

Full Text: [E\Env Tec16, 101.pdf](E/Env%20Tec16,%20101.pdf)

Abstract: As an alternative to standard processes for the removal of heavy metals from low content effluents, silica gel was used experimentally to sorb dissolved uranium. Batch experiments show that rapid sorption occurs with a first phenomenon instantaneously reducing the metal concentration followed by a second sorption phenomenon of surface precipitation. This conclusion is in agreement with the sorption isotherms observed and with the effect of pH, related to the correlation existing between pH of hydrolysis and pH of effective sorption. Column studies show a good correlation between the experimental data and the calculated break-through curves obtained by the Adams-Bohart or related derived models, and the Clark model. An empirical method of prediction of 10% breakpoint, based on the estimated slope of the break-through curve obtained at 50% of the influent and on the saturation batch concentration in the sorbent, gives a good correlation, for both models cited above, between empirical calculated values and experimental data.

Keywords: Uranium, Adsorption, Silica Gel, Isotherms, Kinetics, Oxide-Water Interface, Uranium Biosorption, *Rhizopus-arrhizus*, Activated Carbon, Model Systems, Adsorption, Surface, Co(II), Cations, SiO2

Zhou, M.L. and Martin, G. (1995), Adsorption kinetics modelling in batch reactor onto activated carbon by the model HSDM. *Environmental Technology*, **16** (9), 827-838.

Full Text: [E\Env Tec16, 827.pdf](E/Env%20Tec16,%20827.pdf)

Abstract: The aim of this work was to simulate adsorption kinetics in batch reactor onto activated carbon by the HSDM model (Homogeneous Surface Diffusion Model) in a range of aromatic compounds. The parameters of the model kf and Ds have been determined by a computer program HSDM.FOR in which some numerical methods were used. These methods allow us to “visualize” in orthogonal allocation positions the evolution of adsorbed concentrations in the grain of activated carbon. The values obtained for kf are about 3.1×10-3 (cm.s-1). But for Ds, there is a correlation between Ds and qe which can be described by the Aguwa relation (1986). According to the results calculated, a phenomenon of the supersaturation in the surface in preliminary kinetic period was observed. The initial concentration plays a role in the kinetic process. We have not only confirmed the mechanism of solute accumulation in the grain of activated carbon proposed by Le cloirec (1983), but also verified the hypothesis of the existence of a parabolic partition of adsorbed concentrations in the grain with a great initial concentration suggested by Yonge (1985).

Namasivayam, C. and Ranganathan, K. (1995), Removal of Pb(II), Cd(II), Ni(II) and mixture of metal-ions by adsorption onto waste Fe(III)/Cr(III) hydroxide and fixed-bed studies. *Environmental Technology*, **16** (9), 851-860.

Full Text: [E\Env Tec16, 851.pdf](E/Env%20Tec16,%20851.pdf)

Abstract: Adsorption of Pb(II), Cd(II) and Ni(II) onto Fe(III)/Cr(III) hydroxide, a waste material from a fertilizer industry, has been investigated by batch mode and fixed bed studies. Parameters studied for batch mode tests include particle size, adsorbent dosage and ionic strength. The adsorption of metal ions increased with increase in adsorbent dosage and decrease in particle size. The adsorption obeys Freundlich isotherm model. There was no significant effect by changing the ionic strength using NaNO3. Combined metals removal by the adsorbent shows the order of adsorption as Pb(II) > Cd(II) > Ni(II).

Keywords: Heavy Metals Adsorption, Fe(III)/Cr(III) Hydroxide, Fixed Bed Studies, Alkaline-Earth, Trace Amounts, Iron, Oxides, Aluminum, Surface, Water

Low, K.S., Lee, C.K. and Wong, S.L. (1995), Effect of dye modification on the sorption of copper by coconut husk. *Environmental Technology*, **16** (9), 877-883.

Full Text: [E\Env Tec16, 877.pdf](E/Env%20Tec16,%20877.pdf)

Abstract: The ability of coconut husk and its dye-coated forms to remove Cu from aqueous solutions has been investigated at different concentrations and pH values. The effects of some common chelators and other metal-ions on Cu sorption were also studied. The equilibrium data obey the Langmuir isotherms for the natural and dye-coated husk-Cu systems. Dye modification led to an enhancement in Cu sorption.

Keywords: Coconut Husk, Copper, Dye Modification, Enhancement, Equilibrium, Isotherms, Modification, Moss, Natural, pH, pH Values, Removal, Sorption, Water

Khan, A.R., Al-Waheab, I.R. and Al-Haddad, A. (1996), A generalized equation for adsortion isotherms for multi-component organic pollutants in dilute aqueous solution. *Environmental Technology*, **17** (1), 13-23.

Full Text: [E\Env Tec17, 13.pdf](E/Env%20Tec17,%2013.pdf)

Abstract: Published models describing equilibrium concentrations of organic pollutants in dilute aqueous solutions on activated carbon powder are compared with published experimental data. In this paper their reliability is examined on the basis of the accuracy with which they represent the experimental data. It is noticed that each model has restrictive validity for the conditions that were derived. Therefore, an attempt is made to develop a generalized relation to cover the entire spectrum of multi-solute adsorption data.

Bosinco, S., Roussy, J., Guibal, E. and Le Cloirec, P. (1996), Interaction mechanisms between hexavalent chromium and corncob. *Environmental Technology*, **17** (1), 55-62.

Full Text: [E\Env Tec17, 55.pdf](E/Env%20Tec17,%2055.pdf)

Abstract: Batch conversion studies have shown that corncob can be used effectively to get rid of hexavalent chromium from aqueous solutions. The process is very pH dependant, a pH of 1 giving the best results. The mechanisms involved in the conversion are reduction and adsorption, the first one being the limiting step, oi the reaction. A model is proposed which seems to simulate the experimental data quite well.

Keywords: Corncob, Biopolymer, Hexavalent Chromium, Reduction, Adsorption, Modified Chitosan, Uranium Sorption, Glutamate Glucan, Removal, Equilibrium, Ions

Notes: highly cited

Ho, Y.S., Wase, D.A.J. and Forster, C.F. (1996), Kinetic studies of competitive heavy metal adsorption by sphagnum moss peat. *Environmental Technology*, **17** (1), 71-77.

Full Text: [1996\Env Tec17, 71.pdf](1996/Env%20Tec17,%2071.pdf); [E\Env Tec17, 71.pdf](file:///H:/HO-reference/E/Env%20Tec17,%2071.pdf)

Abstract: Much of the work on the adsorption of metals by low-cost, natural biosorbents has focussed on the uptake of single metals. In practice, wastewaters are polluted with multiple metals. In addition, the kinetics of adsorption, which are important in the design of treatment systems, have largely been neglected. This paper describes the results of an examination into the adsorption by peat of copper and nickel from both mono and bi-solute systems. These showed that, in general, pore diffusion appeared to be the rate-controlling step and that the presence of ‘contaminant’ copper ions reduced the binding of nickel. In fact, the best interpretation which could be placed on the data was that the behaviour of nickel was unusual. The results also showed that the kinetics of adsorption were best described by a second-order expression rather than a first-order model.

Keywords: Peat, Adsorption, Heavy Metals, Kinetics, Aqueous-Solutions, Waste-Water, Removal, Adsorbents

Onar, A.N., Balkaya, N. and Akyüz, T. (1996), Phosphate removal by adsorption. *Environmental Technology*, **17** (2), 207-213.

Full Text: [E\Env Tec17, 207.pdf](E/Env%20Tec17,%20207.pdf)

Abstract: Phosphate removal efficiencies of 13 natural pumice rock samples obtained from different regions of Turkey were investigated. Samples with high CaO content had high phosphate adsorption capacity. It is concluded that pumice is an effective adsorbent for phosphate if its CaO content is high. The adsorption capacity of a pumice powder sample was calculated from the area under the curve of the plot phosphate concentration vs volume of the effluent as 0.95 mg PO4-3 g-1 pumice powder. Variation of pH, conductivity (S) and redox potential (mV) was also measured during the column experiment. Langmuir and Freundlich adsorption isotherm constants and correlation coefficients were calculated and compared. It was concluded that the adsorption data of phosphate onto pumice powder fitted to the Freundlich adsorption isotherm more than the Langmuir model. Specific surface areas of the pumice powder were calculated at pH 3, 5, 7 and 9. The compounds present in actual waste water have no significant effect on the removal of phosphate. Pumice powder can be regenerated by dilute NaOH and reused.

Keywords: Phosphate Removal, Pumice, Nutrient Removal, Phosphate Adsorption, Isotherm, Tnsac

Aksu, Z., Özer, D., Ekiz, H.I., Kutsal, T. and Çaglar, A. (1996), Investigation of biosorption of chromium(VI) on *Cladophora crispata* in two-staged batch reactor. *Environmental Technology*, **17** (2), 215-220.

Full Text: [E\Env Tec17, 215.pdf](E/Env%20Tec17,%20215.pdf)

Abstract: In this study, the adsorption of chromium(VI) to C. crispata was investigated in a two-staged batch reactor. The sorption phenomenon was expressed by the Freundlich adsorption isotherm and this expression was used for the calculation of the equilibrium value of the residual or adsorbed chromium(VI) concentration (Ceq or Cxeq) at each stage for a given “quantity of alga/volume of waste water containing chromium(VI)” or (Xo/Vo) ratio in a two-staged batch reactor. Experimental Ceq values were compared to calculated ones at each stage. Applications in waste water treatment for chromium(VI) removal have been suggested.

Keywords: *Alga Chlorella-Vulgaris*, Cadmium, Ions, Zinc, *C. Crispata*, Chromium(VI) Adsorption, Two-Staged Batch Reactor, Separation Process

Wong, J.W.C. (1996), Heavy metal contents in vegetables and market garden soils in Hong Kong. *Environmental Technology*, **17** (4), 407-414.

Full Text: [E\Env Tec17, 407.pdf](E/Env%20Tec17,%20407.pdf)

Abstract: Urbanization is one of the major causes of soil pollution of many market garden soils in various municipalities. The aim of this project was to monitor the heavy metal contents in market garden soils and vegetables in Hong Kong as affected by human activities. Cadmium, Zn, Cu and Fb concentrations were determined on soil and two vegetable samples, Brassica chinensis and B. parachinensis, collected from eleven different locations. The EDTA-extractable heavy metal concentrations in soil were analysed to assess their availability for plant uptake. Mean total Cd, Cu, Pb and Zn concentrations for all soil samples were (mg kg-1): 1.01 (range 0.25 to 2.17), 18 (range 5 to 67), 60 (range 24 to 113) and 105 (range 20 to 232), respectively and were all below the investigation levels for contaminated soil. The heavy metal concentrations of soils in more urbanized sites were consistently higher than some remote sites. Significant positive correlations were found between EDTA-extractable and total metal contents in soils for Cu, Pb and Zn (P < 0.05). Heavy metal concentrations in the vegetable species studied were all below the maximum permitted level except for Cd. The mean Cd concentrations in B. chinensis and B. parachinensis were respectively approaching and above the maximum permitted concentration of 0.05 mgCd kg (4) fresh weight. Sites with higher urbanization and traffic volume had higher concentrations of metals in plant tissue. The results indicate that there is a potential risk of a high daily Cd intake in consuming vegetables of Brassica sp. available in the local market.

Keywords: Heavy Metals, Vegetables, Garden Soils, EDTA-Extraction, Cadmium, Contamination

Petronio, B.M., D’Orazio, D., Petruzzelli, G., Gennaro, M.C., Vanni, A. and Liberatori, A. (1996), Characterization of the liquid phase of sewage sludge. Effects on copper(II) adsorption by soil. *Environmental Technology*, **17** (4), 439-444.

Full Text: [E\Env Tec17, 439.pdf](E/Env%20Tec17,%20439.pdf)

Abstract: A study has been carried out in order to investigate both the role of organic compounds present in sludges and the effect of their decomposition on the adsorption process of copper(II) following application of sludges to soils. Strong interactions occur between soils and water soluble organic compounds of sewage sludges applied to agricultural soil, These interactions influence the adsorption process of the metals, this is promoted by the change in the nature of organic matter that occurs during the decomposition process. The results obtained with soil samples treated by us with the liquid phase of a sewage sludge (LPS), and with soil portions collected in a neighbouring zone treated 10 years ago with sewage sludges have been compared. It appears clear that the behaviour of the soil treated with LPS allows prediction of the adsorption pattern of the sludge-amended soil towards heavy metals.

Keywords: Sewage Sludge, Soil, Copper(II) Adsorption, Plant Uptake, Organic-Matter, Amended Soils, Cadmium, Temperature, Sorption, Zinc, Time

Farnworth, J.J., Hayes, M.H.B., Nunn, J.W. and Chipman, J.K. (1996), The use of beringite to remove fulvic acids (mutagen precursors) from water. *Environmental Technology*, **17** (5), 509-516.

Full Text: [E\Env Tec17, 509.pdf](E/Env%20Tec17,%20509.pdf)

Abstract: Dissolved humic substances, which are mostly fulvic acids, impart colour to natural waters. Colour from humic substances is especially evident in waters from upland peats. Chlorination of such waters may result in the formation of bacterial mutagens, hence there is a need for methods for the removal of the coloured materials prior to chlorination. A column system of Beringite (a calcined Palaeozoic schist) has been used in the present study for this purpose. Results show that although Beringite can sorb fulvic acids (and thus mutagenic precursors) from water its sorption capacity is low. Methods were investigated for the desorption from Beringite of the sorbed mutagen precursors. Sodium carbonate removed approximately 72% of the sorbed humic material and was the most effective,of the chemical agents used to regenerate the Beringite. Tetrasodium pyrophosphate displaced approximately 65% of the colour, but it formed a complex with the Beringite which solidified. Sodium hydroxide and sodium tetraborate were ineffective desorbing agents.

Keywords: Beringite, Colour Removal, Chlorination By-Products, Fulvic Acids, Mutagenicity, Drinking-Water, By-Products, 3-Chloro-4-(Dichloromethyl)-5-Hydroxy-2<5h>-Furanone, Chlorination, Disinfection, Cancer, Resins

Tan, W.T., Lee, C.K. and Ng, K.L. (1996), Column studies of copper(II) and nickel(II) ions sorption on palm pressed fibers. *Environmental Technology*, **17** (6), 621-628.

Full Text: [E\Env Tec17, 621.pdf](E/Env%20Tec17,%20621.pdf)

Abstract: The efficiency of palm pressed fibres (PPF) in removing copper(II) and nickel(II) ions from solution was investigated in column experiments. Homogeneous column studies show that metalsorption increased with lower flow rate, higher bed-depth and lower metal ion concentration. Bed-depth service time (BDST) studies show that the results agree with the BDST model proposed by Hutchins [1]. The mixed media studies using sand-soil PPF combination demonstrated that PPF can be an efficient sorbent in the prevention of leaching of metal ions in landfill.

Jun, S., Chung, K.H. and Moon, C.H. (1996), Adsorption of cadmium species on montmorillonite investigated by 113Cd NMR spectroscopy. *Environmental Technology*, **17** (6), 655-660.

Full Text: [E\Env Tec17, 655.pdf](E/Env%20Tec17,%20655.pdf)

Abstract: Increasing quantities of montmorillonite (1, 2, and 3% w/v) were added to aqueous CdCl2 solution ([CdCl2] = 4.11×10-2 M) and the change in the cadmium and chloride concentrations remaining in the supernatants were measured from the peak intensity and chemical shift data obtained from 113Cd NMR spectra. The decrease of cadmium concentration was not accompanied by any changes in the chloride concentration, indicating that only the free cadmium ion (Cd2+) is adsorbed on the negatively charged solid-surfaces of montmorillonite. A single peak at chemical shift of δ -8 was recorded in the 113Cd magic angle spinning (MAS) NMR spectrum of the sedimented montmorillonite. This value is similar to that obtained for the solid [Cd(H2O)6](ClO4)2, indicating that only Cd2+ ion is selectively adsorbed and are bound to oxygen donors of montmorillonite clays.

Bonifazi, M., Pant, B.C. and Langford, C.H. (1996), Kinetic study of the speciation of copper(II) bound to humic acid. *Environmental Technology*, **17** (8), 885-890.

Full Text: [E\Env Tec17, 885.pdf](E/Env%20Tec17,%20885.pdf)

Abstract: The kinetically distinguishable species present in a solution of Cu(II) equilibrated with a soil humic acid have been identified by a kinetic method based on ligand displacement reactions with 3-propyl-5-hydroxy-5-(d-arabino-tetrahydroxybutyl) thiozolidine-2-thione (PHTTT). An approximate Laplace transform is used to assign the minimum number of components and approximate their associated concentrations and dissociation rate constants. The initial parameters are refined by a non-linear multi-exponential least squares regression routine. The two rate constants 0.093 and 0.0077 sec-1 consistently represent the middle and slow components of the copper-humic acid complex (CuHA). A fast component which reacts on mixing is the major component present, Species concentrations vary in a reasonable way with pH and HA/Cu(II) ratio supporting the conclusion that the speciation model has chemical significance.

Keywords: Copper, Humic Acid, Kinetics, Metal Bioavailability, Laplace Transform, Laurentian Fulvic-Acid, Adsorption, Oxide, Soil, Metals, Water

Lee, C.K., Low, K.S. and Chow, S.W. (1996), Chrome sludge as an adsorbent for colour removal. *Environmental Technology*, **17** (9), 1023-1028.

Full Text: [E\Env Tec17, 1023.pdf](E/Env%20Tec17,%201023.pdf)

Abstract: The potential of chrome sludge, a waste product from the electroplating industries, to remove colour from aqueous solutions was investigated. Results indicated that the sludge had better affinity for acid than basic dyes. Equilibrium data can be fitted into the Langmuir isotherm with maximum sorption of 30-60 mgg-1 for the range of add dyes studied. The process followed a first order rate kinetics and the rate of dye removal was influenced by concentration and agitation speed.

Keywords: Chrome Sludge, Dyes, Adsorption, Agitation, Natural Adsorbents, Textile Effluents, Aqueous-Solutions, Fly-Ash, Adsorption, Equilibrium, Dyestuffs, Cost, Clay, Dye

Choi, Y.S. and Cho, J.H. (1996), Color removal from dye wastewater using vermiculite. *Environmental Technology*, **17** (11), 1169-1180.

Full Text: [E\Env Tec17, 1169.pdf](E/Env%20Tec17,%201169.pdf)

Abstract: The purpose of this laboratory study was to investigate the effectiveness of vermiculite extract solutions (VES) as a coagulant and of vermiculite as an adsorbent for removal of color from dye wastewater. In coagulation experiments, it was found that VES could be applied to the treatment of dye wastewater with its contents of various cations (e.g. Mg, Fe, Al Ca Si etc.) useful for coagulation. Coagulation with VES produced less sludge at a lower coagulant dosage in comparison with to conventional inorganic coagulants. For evaluation of adsorption characteristics of vermiculite on basic dye wastewater, adsorption parameters for Langmuir and Freundlich isotherms were determined. The adsorption of the basic blue dye on vermiculite was found to conform with both isotherms. The adsorption capacity of vermiculite was found to increase with the decreasing particle size and with the increase of temperature and of intensity of agitation. The results indicate that vermiculite is an excellent adsorbent for basic blue dye wastewater and only moderately, short contact times are required to reach equilibrium at the dye concentrations investigated. Spent vermiculite can be regenerated at high temperature and then be reused. The cost of applied vermiculite is 11% of that of the activated carbon.

Keywords: Cations, Color Removal, Dye Wastewater, Vermiculite, Adsorbents, Adsorption, Hardwood

Matheickal, J.T., Yu, Q. and Feltham, J. (1997), Cu(II) binding by *E. radiata* biomaterial. *Environmental Technology*, **18** (1), 25-34.

Full Text: [E\Env Tec18, 25.pdf](E/Env%20Tec18,%2025.pdf)

Abstract: Experimental studies showed that a common brown marine algae (*Ecklonia radiata*) can be used for the development of an efficient biosorbent material for Cu2+ removal from waste water. At pH 5.0, the uptake capacity of E.radiata for copper is 1.11 mmolg-1. The adsorption of copper increases as pH increases and reaches a plateau at pH 5 The copper uptake process was rapid, with 90% of the adsorption completed within 15 minutes. Presence of Light metal ions in solution did not affect copper adsorption significantly. The presence of 5 mM of EDTA in solution completely inhibited the metal uptake while the effect of acetate, nitrate and chloride on metal uptake was marginal even at 20 mM concentrations of these ions. The dominant mechanism of copper biosorption is ion exchange involving Ca2+ and Mg2+ counter ions present in the algal cells. The feasibility of removing copper using the biosorbent in a packed bed system was also examined.

Keywords: *Rhizopus-arrhizus* Biomass, Heavy-Metals, Biosorption, Agardh, Copper, Biosorbent, Biosorption, Copper Removal, Ecklonia Radiata, Marine Algae

Wong, J.W.C. and Mak, N.K. (1997), Heavy metal pollution in children playgrounds in Hong Kong and its health implications. *Environmental Technology*, **18** (1), 109-115.

Full Text: [E\Env Tec18, 109.pdf](E/Env%20Tec18,%20109.pdf)

Abstract: Due to the scarcity of land in Hong Kong, most of the children playgrounds are being built on marginal lands which may be subjected to serious atmospheric emission. Hence, children playing in these playgrounds are exposed to a potential health risk. The aim of this study was to evaluate heavy metal pollution in children playgrounds using surface dusts and soils as indicators. Surface dust and soil samples were collected from seven selected playgrounds with different levels of traffic volume and urban development for the determination of total Cd, Cu, Pb and Zn concentrations. The mean Cd, Cu, Pb and Zn concentrations of surface dusts were 2.63, 201, 302 and 1517 mgkg-1 respectively, whereas for soils they were 2.30, 28.4, 195 and 237 mgkg-1. The results indicated elevated concentrations of Cd, Cu, Fb and Zn in both dust and soil samples especially for those samples collected from busy commercial and industrial areas i.e., Mei Foe, Tsim Sha Tsui and North Point. Surface dusts were enriched relative to soils in each metal, on average, by factors ranging from 1.1 to 7.1. The metal contents in dust and soil samples were significantly correlated with traffic volume. Significant correlations were also noted among all the metals studied indicating that Pb and Zn in the samples may be due to the same source i.e., automobile. The soil Pb and Zn contents of Mei Foo and North Point were higher than the investigation level of the Dutch Criteria for these two metals which indicated that further investigation is required to confirm their health hazard on children playing in these playgrounds.

Keywords: Heavy Metals, Surface Dusts, Environmental Indicator, Surface Soils, Children Playgrounds, Street Dust, Soils, Lead, Copper, Zinc, Cadmium

Labouyrie, L., Le Bec, R., Mandon, F., Sorrento, L.J. and Merlet, N. (1997), Comparison of biological activity of different types of granular activated carbons. *Environmental Technology*, **18** (2), 151-159.

Full Text: [E\Env Tec18, 151.pdf](E/Env%20Tec18,%20151.pdf)

Abstract: In drinking water production plants, two phenomena occur into the granular activated beds: physical adsorption of organic matter, especially of micropollutants and biodegradation of a part of the dissolved organic carbon. In order to get a better understanding of the development of biological activity a comparative test has been studied on four GAC from different origins and way of manufacturing, and with various characteristics (porosity, density, specific surface, ..). For that purpose, preliminary experiments led to the choice of an organic compound, nitro-4-phenol, which presents an average biodegradability. Four minicolumns, each one filled with one GAG, plus another one filled with sand (as a non-porous reference material) were run in parallel at a flow rate of 0.5 l h-1 (i.e. a linear velocity of about 5 m h-1). In the first step of the test, GAC were saturated in batch with an aqueous solution of nitro-4-phenol at a standard temperature of 25°C. In the second step, columns of GAC were fed with a solution of nitro-4-phenol at a concentration of 13.9 mg l-1 enriched with nutrients buffered at pH 7.9, this led to the development of microbial activity. The biodegradation occured rapidly, three days after the columns have been fed. When equilibrium was reached after a running of 10-15 days, the biodegradation yield stabilized at about 50% for all kinds of GAG, with no significant differences. Oxygen appears to be a determinant factor for a total mineralization of the nitro-4-phenol. Dissolved oxygen and temperature were shown to control the rate of bioactivity. At lower concentrations of nitro-4-phenol, the oxygen demand decreased and thus allowed a larger biodegradability which could reach 100% in yield. This yield fell down to about 50% when the temperature was maintained at 5°C. These observations were quite similar for all types of GAC tested (pinewood based chemically or physically activated-bituminous coal based or coconut based) and for sand. AU these experiments have been realized at a concentration in ammoniacal nitrogen of 6.5 mg l-1. A lack in this component did not lead to a reduction of the biodegradation. So far, it seems that physical characteristics of GAC (porosity, raw material, ..) do not play an important role in the development of biological activity, suggesting that microorganisms are mainly fixed on the external surface of GAC.

Keywords: Filters, Granular Activated Carbons, Biodegradation, BDOC, Biological Activity, Mineralization, Nitro-4-Phenol

Munaf, E., Zein, R., Kurniadi, R. and Kurniadi, I. (1997), The use of rice husk for removal of phenol from waste water as studied using 4-aminoantipyrine spectrophotometric method. *Environmental Technology*, **18** (3), 355-358.

Full Text: [E\Env Tec18, 355.pdf](E/Env%20Tec18,%20355.pdf)

Abstract: The study of the removal of phenol from waste water by using rice husk has been carried out. Phenol concentration was measured by using 4-aminoantipyrine as colouring agent and detected at 506 nm using visible spectrophotometer spectronic 21. Several parameters that can affect phenol uptake such as particle size, pH and concentration of reagents were described. At the optimal conditions, phenol substance removal from aqueous solution is 92%. The method was applied to removal phenol substance present in plywood industry and hospital waste waters.

Munaf, E. and Zein, R. (1997), The use of rice husk for removal of toxic metals from waste water. *Environmental Technology*, **18** (3), 359-362.

Full Text: [E\Env Tec18, 359.pdf](E/Env%20Tec18,%20359.pdf)

Abstract: The ability of rice husk to remove chromium, zinc, copper and cadmium from waste water has been investigated. Several parameters that can affect metals uptake such as particle size, pH and temperature were described. At the optimal conditions, the chromium, zinc, copper and cadmium ions removal from aqueous solution are 79, 85, 80 and 85%, respectively. After the adsorption of metal ions, the analyte retained in the husk could be recovered almost completely by eluting with dilute hydrochloric add solution. The method was applied to removal chromium, zinc, copper and cadmium present in the laboratory waste water.

Keywords: Sorption, Copper, Rice Husk, Toxic Metals, Waste Water

Low, K.S., Lee, C.K. and Tan, S.G. (1997), Sorption of trivalent chromium from tannery waste by moss. *Environmental Technology*, **18** (4), 449-454.

Full Text: [E\Env Tec18, 449.pdf](E/Env%20Tec18,%20449.pdf)

Abstract: The sorption of Cr(III) from synthetic solution and tannery waste using moss, *Calymperes delessertii* Besch, was conducted under laboratory conditions to assess its potential in removing Cr(III). Parameters investigated include pH, contact time, initial concentration and sorbent dosage. Results obtained from isotherm studies show that the sorption of Cr(III) by moss followed the Langmuir isotherm and the maximum sorption capacities were 15.4 and 13.7 mg g-1 for synthetic solution and tannery waste respectively.

Gicquel, L., Wolbert, D. and Laplanche, A. (1997), Adsorption of Atrazine by powdered activated carbon: Influence of dissolved organic and mineral matter of natural waters. *Environmental Technology*, **18** (5), 467-478.

Full Text: [E\Env Tec18, 467.pdf](E/Env%20Tec18,%20467.pdf)

Abstract: Contamination of the natural raw waters by pesticides requires the use of an activated carbon treatment in the municipal water treatment plant. One of the main factors affecting the efficiency of this process is the presence of natural organic and mineral dissolved material. This research studied the influence of this material on the atrazine adsorption. The experiments were carried out with four of the most used activated carbon in the water treatment plants and five waters, taken at different treatment stages. The results confirm the competition between the pesticide and the dissolved matter. They also show the complexity of the responsible interactions, which depend on the nature of the activated carbon, the nature and concentration of the organic and mineral matter, as well as the level of pesticide.

Juang, R.S., Wu, F.C. and Tseng, R.L. (1997), The ability of activated clay for the adsorption of dyes from aqueous solutions. *Environmental Technology*, **18** (5), 525-531.

Full Text: [E\Env Tec18, 525.pdf](E/Env%20Tec18,%20525.pdf)

Abstract: A low-cost inorganic acid-activated clay was used adsorbent for the adsorption of six dyes (two basic, one acidic, one disperse, one direct dye, and one reactive) from aqueous solutions. The adsorption capacity was comparatively high for basic dyes and was lower for disperse, direct, and reactive dyes. The equilibrium data could be well described by the Langmuir equation over the entire range of concentration (50-500 mgdm-3). In addition, the effect of temperature on the adsorption was examined and the thermodynamic data were determined. Based on the adsorption capacity only, it was generally shown that activated day was more effective compared to ether commonly used adsorbents.

Keywords: Color Removal, Textile Effluents, Waste-Water, Fly-Ash, Equilibrium, Dyestuffs, Carbon, Cost, Adsorbents, Acid, Adsorption Ability, Activated Clay, Dyes, Equilibrium, Langmuir Isotherm

Farrow, A., Taylor, H. and Golding, J. (1997), Time spent in the home by different family members. *Environmental Technology*, **18** (6), 605-613.

Full Text: [E\Env Tec18, 605.pdf](E/Env%20Tec18,%20605.pdf)

Abstract: The study objective was to assess the length of time spent inside the home for each family member in a sample population in the southwest of England. Such information is vital in any study concerned with exposure to pollutants in the home environment, in order to calculate a dose response for a specific health effect in the individual. The design was a longitudinal observational study which started in pregnancy and was carried out for one week in each month over a 12 month period. The setting was a sample of 170 families within the Avon Longitudinal Study of pregnancy and Childhood (ALSPAC) where indoor air pollutants were being measured. The number of hours spent in the home each day for each family member was obtained from self-report using weekly diary sheets. The results indicated that mothers, fathers and young infants spent an average of 18.4 (76.7%), 14.7 (61.3%) and 19.3 (80.4%) hours per day, respectively, in the home, In winter, infants spent longer in the home than in the summer months. At weekends, the amount of time spent at home by the father increased, but that of the mother and infant decreased. The results emphasize the importance of assessing duration of exposure in any study concerned with the health effects of air pollution.

Keywords: Exposure, Risk Assessment, Pregnancy, Indoors Infants, Volatile Organic-Compounds, Indoor Air-Pollution, Nitrogen-Dioxide, Asthmatic-Patients, Human Exposure, Environments, Allergen, Assessments, Children

Lee, S.H., Vigneswaran, S. and Chung, Y. (1997), A detailed investigation of phosphorus removal in soil and slag media. *Environmental Technology*, **18** (7), 699-709.

Full Text: [E\Env Tec18, 699.pdf](E/Env%20Tec18,%20699.pdf)

Abstract: Kinetic studies on phosphorus (P as orthophosphate) sorption onto a sandy loam soil hom North Sydney, Australia, and a slag (waste products from the BHP steel industry, Australia) revealed that more than 90% of the P was adsorbed within 70 and 12 hours for the soil and slag respectively. The pH of the P solution played a critical role in the rate of P removal. Removal was at a minimum at pH 2. Dominant removal mechanism of P at pH less than 8 was physical sorption, while it was chemical precipitation at pH greater than 10. Adsorptive capacity of the slag was 225 and 53 times of that of the soil for the static and dynamic systems respectively. Breakthrough curves obtained from the column experiments are S-shaped and more spreaded with the decrease of influent P concentration. Simulated results from an equilibrium sorption model (ESM) and Freundlich isotherm constants did not always match the corresponding experimental breakthrough data. Mobility of P is restricted by the adsorbent due to its high sorption capacity of P.

Keywords: Adsorbent, Breakthrough, Equilibrium Isotherm, Phosphorus Sorption, Precipitation, Solid Phase Concentration, Waste-Water, Adsorption, Sediment, Columns, Cadmium, Calcium, Models, Sand

Green-Pedersen, H., Jensen, B.T. and Pind, N. (1997), Nickel adsorption on MnO2, Fe(OH)3, montmorillonite, humic acid and calcite: A comparative study. *Environmental Technology*, **18** (8), 807-815.

Full Text: [E\Env Tec18, 807.pdf](E/Env%20Tec18,%20807.pdf)

Abstract: Nickel adsorption on 5 different solid phases: amorphous-MnO2, amorphous-Fe(OH)3, CaCO3, humic acid and montmorillonite were studied. Comparative studies at pH: 6.7 - 8.4, using a conditional stability constant, showed that the order of surface affinity for Ni, followed the sequence: MnO2 > Fe(OH)3 > humic acid similar to montmorillonite > CaCO3. MnO2 and Fe(OH)3 are therefore proposed as the major sinks for Ni in fresh water systems. Adsorption on montmorillonite and humic acid were described as linear. Adsorption on MnO2 was described by a Langmuir isotherm, whereas adsorption on Fe(OH)3 was described by the Redlich-Peterson model. Increasing the ionic strength decreases Ni adsorption on MnO2 and montmorillonite, whereas adsorption on Fe(OH)3 was unaffected. Adsorption on Fe(OH)3 was strongly effected by pH, in the region of 7.0 - 8.0, adsorption on MnO2 was unaffected, in the same region. The speciation calculation of NL(II) in the pH region of 7.0 - 8.0, indicates that Ni2+ dominates at pH < 7.7, and NiCO30 dominates at pH > 7.7. The adsorption capacity of MnO2 and Fe(OH)(3) was found to be large enough to keep the Ni concentration well below the threshold value for Danish drinking water (50 μg L-1).

Keywords: Nickel Adsorption, Hydrous Oxides, Montmorillonite, Humic Acid, Calcite, Hydrous Ferric-Oxide, Ionic-Strength, Metal Sorption, River Water, Manganese, Cadmium, Copper, Cd, Complexation, Constants

Texier, A.C., Andrès, Y. and Cloirec, P.L. (1997), Selective biosorption of lanthanide (La, Eu) ions by *Mycobacterium smegmatis*. *Environmental Technology*, **18** (8), 835-841.

Full Text: [E\Env Tec18, 835.pdf](E/Env%20Tec18,%20835.pdf)

Abstract: The ability of *Mycobacterium smegmatis* to adsorb lanthanide (lanthanum (La), europium (Eu)) cations from aqueous solutions was studied. Adsorption isotherms of lanthanum ions showed that the adsorption capacity was higher for wet biomass than for dry biomasses (37°C and 70°C). The biosorption capacity on cells dried at 70°C is reduced. Potentiometric titrations revealed the existence of at least two types of acidic functions in the cell wall, with strong and weak affinity. The weak acidic groups became inaccessible at a drying temperature of 70°C. Lanthanum and europium adsorption by *Mycobacterium smegmatis* obeyed the Freundlich and Langmuir isotherm relations. Eu3+ was preferentially adsorbed with respect to the lanthanum cations. The extended Langmuir equation enabled a preliminary theoretical approach of the multicomponent adsorption phenomenon.

Özer, A., Tümen, F. and Bildik, M. (1997), Cr(III) removal from aqueous solutions by depectinated sugar beet pulp. *Environmental Technology*, **18** (9), 893-901.

Full Text: [E\Env Tec18, 893.pdf](E/Env%20Tec18,%20893.pdf)

Abstract: We report a study of the removal of Cr(III) from aqueous solutions by depectinated sugar beet pulp (DSBP) carried out at different initial concentration of Cr(III), pH and temperature of solution, particle size and adsorbent dosage. Removal percentage of Cr(III) was found to be 86 for inital concentration of 10 mg L-1 at 20°C and 20 g L-1 adsorbent dosage. The optimum pH for the process was found to be 4.5. The process of uptake follows first-order adsorption rate expression and obeys Langmuir and Freundlich’s adsorption models. Enthalpy change of adsorption was found to be 27.3 kJ mol-1. Little fraction of Cr(III) was desorbed in strong acidic media.

Keywords: Cr(III) Removal, Sugar Beet Pulp, Adsorption, Thermodynamic Parameters, Desorption, Activated Carbon, Water-Treatment, Chromium, Waste, Adsorption, Peat, Moss

Susarla, S., Bhaskar, G.V. and Bhamidimarri, S.M.R. (1997), Competitive adsorption-desorption kinetics of phenoxyacetic acids and a chlorophenol in volcanic soil. *Environmental Technology*, **18** (9), 937-943.

Full Text: [E\Env Tec18, 937.pdf](E/Env%20Tec18,%20937.pdf)

Abstract: Competitive adsorption and desorption kinetic experiments with 2,4-dichlorophenoxyacetic add (2,4-D), 2-methyl-4-chlorophenoxyacetic acid (MCPA) and para-chloro-ortho-cresol in a volcanic soil clearly demonstrated that the rate of diffusion in mixtures of these chemicals are different compared to single solute values and therefore the assumption of single diffusion coefficient values may not be valid in many realistic situations. In the present article, the experimental data obtained from the batch reactor were compared with numerical calculations of a homogeneous surface diffusion model, developed for bicomponent systems. The model used the single component Freundlich parameters and the competition coefficients from bicomponent sorption experiments. The results showed that the adsorption surface diffusion coefficients were smaller by 12, 4 and 6% for 2,4-D, MCPA and PCOC, respectively, while for desorption they were smaller by 4-8%, which is attributed to competition between the solutes. In general, good agreement between the numerical and experimental results was obtained for all cases considered.

Keywords: Adsorption, Competition, Desorption, Freundlich Isotherm, Surface Diffusion, Activated Carbon, Systems, Transport, Model

Desauziers, V., Castre, N. and Cloirec, P.L. (1997), Sorption of methylmercury by clays and mineral oxides. *Environmental Technology*, **18** (10), 1009-1018.

Full Text: [E\Env Tec18, 1009.pdf](E/Env%20Tec18,%201009.pdf)

Abstract: Experiments on the sorption behaviour of methylmercury (CH3Hg+) by clays and mineral oxides showed that adsorption was rapid for all the colloids investigated and that the adsorption kinetics conformed to a first order model. The doubly inflected isotherms observed in most of the sorption studies seem to indicate the occurence of several adsorption mechanisms. Adsorption continued even after saturation of the reactive sites, probably owing to hydrophobic interactions between the methyl groups of the methylmercury in solution and those of CH3Hg+ already adsorbed. The determination of the adsorption parameters led the sorbents to be classified according to their sorption capacities. The maximum adsorption capacity was found in expandable clays having high cation exchange capacities. Hence, it could be suggested that one of the mechanisms involved in methylmercury retention by clays is related to an interlayer adsorption. This was confirmed by X-ray diffraction analysis. Considering mineral oxides, the sorption capacity measured for goethite (iron oxyhydroxide, α-FeOOH) is higher than for hausmanite (Mn3O4). For these sorbents, surface complexation and surface precipitation are probably responsible for the CH3Hg+ sorption.

Komarowski, S. and Yu, Q. (1997), Ammonium ion removal from wastewater using Australian natural zeolite: Batch equilibrium and kinetic studies. *Environmental Technology*, **18** (11), 1085-1097.

Full Text: [E\Env Tec18, 1085.pdf](E/Env%20Tec18,%201085.pdf)

Abstract: The removal of nutrients from wastewater is becoming increasingly important throughout the world. This paper reports work on batch equilibrium and kinetic laboratory studies conducted to establish the efficiency of ammonium ion removal from wastewater effluent using a natural zeolite from the Werris Creek region in New South Wales. Experiments were conducted using samples of secondary treated domestic wastewater effluent and synthetic wastewater (ammonium chloride solution). The amount of powdered zeolite added ranged from 5 to 50 gl-1. Experiments were undertaken to characterise the zeolite in terms oi its ion exchange capacity and rate of ammonium ion adsorption under various conditions. The effects of the amount of zeolite added, initial ammonium ion concentration arid pH of the sample on ammonium ion removal were studied. Results were analysed using existing ion exchange models. The results indicate that a significant reduction of N as NH, (up to 80%) can be achieved using batchwise addition of powdered natural zeolite to NH4Cl solution. The ammonium ion removal capacity from wastewater effluent using 5 gl-1 zeolite is about 2 mgg-1 (compared to 3.7 mgg-1 from NH4Cl solution) for an initial ammonium ion concentration of 25 mgl-1. The ammonium ion removal efficiency increases with higher initial ammonium ion concentration and is highest for pH 5.5. Two adsorption models were fitted to the equilibrium data. The Freundlich adsorption model gives a better fit than the Langmuir model in the range of pH studied (pH 4-7) suggesting lateral interactions between adsorbed ions. From kinetic experiments 90% of ammonium ion removal occurs within 10-15 minutes and equilibrium is reached within 1.5-2 hours.

Keywords: Sorption, Chitosan, Nutrient Removal, Ammonium Ion Removal, Natural Zeolite, Clinoptilolite, Ion Exchange

Lalvani, S.B., Wiltowski, T.S., Murphy, D. and Lalvani, L.S. (1997), Metal removal from process water by lignin. *Environmental Technology*, **18** (11), 1163-1168.

Full Text: [E\Env Tec19, 1163.pdf](E/Env%20Tec19,%201163.pdf)

Abstract: Lignin obtained as a byproduct from the paper and pulp industry in the form of powder and beads (obtained upon polymerization) was used for the removal of trivalent and hexavalent chromium, lead and zinc from aqueous solutions. Metal uptake as a function of time and temperature was determined. It appears that oxygen functionalities such as phenols present in lignin may serve as sites for the metal cation exchange. The metal bearing lignin upon a wash with 10% sulfuric acid results in elution of copious amounts of metal. The dissolved metals in a concentrated form in the acid can be precipitated by addition of alkali resulting in the metal recovery.

Keywords: Chromium, Lignin, Chromium, Zinc, Lead, Adsorption

Albanis, T.A., Danis, T.G. and Kourgia, M.G. (1998), Adsorption-desorption studies of selected chlorophenols and herbicides and metal release in soil mixtures with fly ash. *Environmental Technology*, **19** (1), 25-34.

Full Text: [E\Env Tec19, 25.pdf](E/Env%20Tec19,%2025.pdf)

Abstract: The influence of flyash on the adsorption and desorption of four selected chlorophenols and two herbicides has been studied in mixtures with a sandy day loam (SCL) soil. Fly ash and soil mixtures with a range of fly ash content from 0 to 30% were used to study adsorption and desorption of four chlorophenols, 2,4-dCP, 2,4,6-TCP, 2,3,5,6-TCP and PCP as well as two selected herbicides, alachlor and metolachlor, in batch experiments. The linear isotherms indicated a constant partition of chlorophenols and herbicides between the bulk solution and mixtures of fly ash and soil, for a concentration range from 0.025 to 0.2 mgl-1 for chlorophenols and 0.1 to 10 mgl-1 for herbicides. Mass balance estimations show that the adsorbed amounts of chlorophenols in mixtures of soil with 30% fly ash content, are up to 36.5% for 2,4-dCP, 55.8% for 2,4,6-TCP, 68.7% for 2,3,5,6-TCP and 84.9% for PCP and the respectivelly adsorbed amounts of herbicides in mixtures with 20% fly ash are up to 37.5% for alachlor and 43.2% for metolachlor. In contrast, the amounts of desorption decrease as the fly ash content and the number of chlorines in the phenolic ring increase. Results of leaching tests of metals from soil mixtures with fly ash have shown that as the fly ash content and pH Values increase, the concentration of Mg, Mn and Fedecrease in the aqueous solutions by metal precipitation. The concentrations of Ni, Cuand Znremain at low levels and the concentration of Cr increase due to the formation of more soluble metalspecies at high pH values.

Araujo, A.C.P., Telles, D.L., Gorni, R. and Lima, L.L.A. (1998), Organochlorine pesticide contamination in the Ipojuca basin, Brazil. *Environmental Technology*, **19** (1), 109-113.

Full Text: [E\Env Tec19, 109.pdf](E/Env%20Tec19,%20109.pdf)

Abstract: In this study the first measurements of chlorinated pesticide pollution in the Northeast region of Brazil are reported. Water samples collected at 28 stations along the Ipojuca river, during both the dry and rainy seasons, were analysed for 18 common organochlorine pesticides. Residues were extracted inn-hexane, cleaned up with Florisil column and then quantitatively analysed by gas chromatography. Heptachlor and HCH residues, at levels as high as 50 and 4 µg l-1, respectively, were detected in almost half these samples. Additionally low levels of aldrin, DDT, chlordane and endrin were also found in samples collected adjacent to highly populated areas. The presence of these chlorinated insecticides in the environment may, possibly, be ascribed to the side effects of public health programs.

Chakravarty, R., Prasad, G. and Raupainwar, D.C. (1998), Static removal of copper(II) from aqueous solutions by hematite. *Environmental Technology*, **19** (3), 315-322.

Full Text: [E\Env Tec19, 315.pdf](E/Env%20Tec19,%20315.pdf)

Abstract: This study examines the adsorption characteristics for the removal of copper(II) from aqueous solution using natural hematite which is available in abundance in this country. The static characterisation of the kinetics of the adsorption process has been studied using batch experiments at different adsorbate/adsorbent ratios for pH for fixed ionic strength. Adsorption isotherms have been modelled with the help of both Langmuir and Freundlich formulae. The dependence of the adsorption of the metal ion on the pH of the solution has been studied to achieve a better understanding of the adsorption mechanism. it has been found that maximum adsorption of Cu(II) from aqueous solution takes place at a pH value of 8.0. It has been concluded that the adsorption process comprises monolayer adsorption followed by intraparticle diffusion.

Keywords: Adsorption, Peat, Ions, Adsorption Kinetics, Hematite, Copper Removal, Langmuir, Freundlich

Wasay, S.A., Barrington, S.F. and Tokunaga, S. (1998), Remediation of soils polluted by heavy metals using salts of organic acids and chelating agents. *Environmental Technology*, **19** (4), 369-379.

Full Text: [E\Env Tec19, 369.pdf](E/Env%20Tec19,%20369.pdf)

Abstract: Various weak organic adds and/or their salts were tested for the remediation of a loam and a sandy day loam naturally polluted by heavy metals for over three years against two strong synthetic chelating agents (EDTA and DTPA). Among 7 weak organic acids and/or their salts, citrate, tartarate and oxalate were found to effectively remove Cd, Cu, Pb and Zn from the two soils in double extractions, at a wide range of pH. Citrate removed 80 to 99.9% of all four metals within 24 h at pH from 23 to 7.5. Tartarate removed 84 to 99.9% of all metals from both soils within 24 h at pH from 2.1 to 6.7. Oxalate alone is not effective in removing metals particularly Fb but with ammonium citrate (1: 1 ratio) removed effectively 82, 70, 99.9, and 99.9% for Cd, Pb, Cu and Zn, respectively at pH from 2.6 to 5.8. Zinc met the Quebec A level soil clean-up criteria after two extractions whereas Cu and Pb reached the B level. Probably, two more extractions with these weak organic acids and/or their salts are required to meet the A level for the soil dean-up criteria for Cd, Cu and Pb. EDTA and DTPA removed 75 to 99.9% of the heavy metals within 24 h at pH from 3.5 to 9.0 for both soils. Citrate and tartarate were found to remove heavy metals from two contaminated soils, as effectively as EDTA and DTPA. But compared to EDTA and DTPA they removed 80% less macronutrients from the soil and improve its structure. Weak organic acids and/or their salts therefore can be used as an environmentally friendly remediation technique.

Keywords: Soil Remediation, Heavy Metals, Salts of Weak Organic Acids, Edta, Dtpa, Extraction

Young, E. and Banks, C.J. (1998), The removal of lindane from aqueous solution using a fungal biosorbent: The influence of pH, temperature, biomass concentration, and culture age. *Environmental Technology*, **19** (6), 619-625.

Full Text: [E\Env Tec19, 619.pdf](E/Env%20Tec19,%20619.pdf)

Abstract: A heat treated non viable cell suspension of the fungus *Rhizopus* oryzae was used for the removal of low concentrations of lindane from aqueous solution in a series of shake flask experiments. Experimental design was such as to allow the data to be tested against the Freundlich adsorption isotherm model thus quantifying the effect of experimental variables on both the adsorption capacity and intensity of adsorption exhibited by the fungus. The effects of temperature (5-45°C), pH (2.0-10), biomass density (1-12 g l-1) and biomass age (1-7 days) were studied. The results indicated that the mechanism of adsorption was by physical bonding of the negatively charged lindane molecule to the negatively charged fungal cell wall with hydrogen ions acting as the bridging ligand. Adsorption was most effective at low temperature and pH and was shown to be influenced, to a lesser extent, by cell density and biomass age. Data are presented in the form of adsorption isotherms and the Freundlich parameters associated with each of the experimental variables tabulated.

Keywords: Biosorption, Lindane, Fungal, Heavy-Metal, Activated-Sludge, Biosorption, Adsorption, Mechanisms, Desorption, Organics, Cadmium, Waters, Yeast

Wibulswas, R., White, D.A. and Rautiu, R. (1998), Removal of humic substances from water by alumina-based pillared clays. *Environmental Technology*, **19** (6), 627-632.

Full Text: [E\Env Tec19, 627.pdf](E/Env%20Tec19,%20627.pdf)

Abstract: This paper deals with the synthesis and use of alumina-pillared clays, Al-PILCs, for water treatment in removing humic substances. Al-PILCs represent a new class of adsorbents with an increased potential for the removal of colour generating compounds such as ‘humic’ and ‘fulvic acids’. High content Al-PILCs were synthesised. Various thermal treatment conditions, 453K and 673K, and the effect of ultrasonic treatment during the preparation of Al-PILCs were also explored. Comparative adsorption experiments were conducted with Montmorillonite, as the starting clay as a reference material, and several different batches of Al-PILCs. Adsorption of ‘humic acid’ from both distilled and tap water were studied. A maximum adsorption capacity of 23.4 mg g-1 of ‘humic acid’ on Al-PILCs was obtained with PILC-O-453 which represents Al-PILCs treated at 453K. Al-PILCs are more effective at removing ‘humic acid’ from tap water especially at high ‘humic acid’ concentrations. The adsorption process is described by Langmuir-type isotherms. It is shown by these experiments that Al-PILCs represents a valuable adsorbent for the removal of colour-generating compounds such as ‘humic acid’.

Keywords: Al-Pilcs, Pillared Clays, ‘Humic Acid’, Humic Substances, Adsorption

Puginier, B., Kedziorek, M.A.M. and Bourg, A.C.M. (1998), Adsorptive behavior of nickel with goethite in the presence of EDTA: Kinetics and reversibility. *Environmental Technology*, **19** (8), 829-835.

Full Text: [E\Env Tec19, 829.pdf](E/Env%20Tec19,%20829.pdf)

Abstract: The influence of EDTA on the adsorption of nickel by goethite has been studied in batch experiments. The nickel adsorption reaches equilibrium in about 3 hours for free (hydrated) Ni and Ni-EDTA, whereas up to 24 hours may be necessary to attain desorptive equilibrium for adsorbed Ni in the presence of EDTA. Nickel behavior is strongly influenced by the presence of EDTA. Nickel solid/solution partitioning depends on the solution pH, the EDTA/Ni ratio and the sequence of introduction of the adsorbates (Ni and EDTA). Compared to the behavior of free Ni at the solid-solution interface, the occurrence of Ni-EDTA complexes increases Ni adsorption at low pH values and decreases adsorption at high pH. The observed data are explained by the formation of a surface-ligand-metal ternary surface complex. Ni uptake depends on the sequence of introduction of the reactants in the goethite suspension (i.e., whether Ni is added with or prior to the EDTA). When EDTA is added to the suspension after Ni had time to equilibrate with the goethite surface, the behavior of Ni at the water-goethite interface is controlled by reaction kinetics. EDTA adsorbs faster than it can complex the dissolved Ni at low pH, and the adsorbed Ni is only slowly desorbed by the EDTA remaining dissolved at high pH.

Alberts, J.J. and Filip, Z. (1998), Metal binding in estuarine humic and fulvic acids: FTIR analysis of humic acid-metal complexes. *Environmental Technology*, **19** (9), 923-931.

Full Text: [E\Env Tec19, 923.pdf](E/Env%20Tec19,%20923.pdf)

Abstract: Humic and fulvic acids isolated from salt marsh estuaries of the southeastern United States had copper binding capacities (CuBC) of 0.16 to 0.26 µg atm Cu2+ mg-1 humic acid and 0.17 to 0.24 µg atm Cu2+ mg-1 fulvic acid. Competitive reactions of humic substances with alkaline earth elements Ca2+ and Mg2+ reduced the CuBC by only 11% for fulvic acids and by 17% for humic acids. Competition with the trivalent metal ions Al3+ and Fe3+ reduced the CuBC in humic substances by 30-40%. Fourier transform infrared (FTIR) spectral analyses of the humic-metal complexes suggest that Cu(II) may be bound preferentially by oxygen-containing functional groups in estuarine fulvic acids, but there is a much higher involvement of nitrogen-containing functional groups in binding Cu(II) to estuarine humic acids. FTIR spectra were also collected for humic acid-metal complexes of Ag, Au, Hg, Mn and Pb.

Ricou, P., Lecuyer, I. and Le Cloirec, P. (1998), Influence of pH on removal of heavy metallic cations by fly ash in aqueous solution. *Environmental Technology*, **19** (10), 1005-1016.

Full Text: [E\Env Tec19, 1005.pdf](E/Env%20Tec19,%201005.pdf)

Abstract: Coal fly ash was used to study adsorption of several cations (Cu2+, Ni2+, Zn2+, Cd2+, Pb2+, Cr(III)) within various experimental conditions: dry or wet fly ash, constant or not constant pH, metallic ion/fly ash mass ratio varying from 0.005 to 0.05. It has been shown that alkalinity of fly ash, increasing pH to 11 for a fly ash concentration equal to 20 g 1-1, leads to higher removal capacity, due partly to bulk solution precipitation. Wet fly ash gives smaller adsorption capacity resulting from lost alkalinity and dissolution of alumina sites at pH 11. Removal order established in non-constant pH condition is: Pb > Cu > Ni > Zn. Experiments carried out at several constant pH levels indicate that sorption capacities for metallic ions increase from 10%. or 40% to 100% when pH varies from 1 to 10. The removal order is: pH > Cr > Cu > Ni > Zn > Cd. Removal observed ns pH was discussed taking the hydrolysis property of the metallic ions into account. It was concluded that two groups of metallic cations should be distinguished: hydrolysing (Cu2+, Pb2+) and non-hydrolysing (Ni2+, Zn2+) Lead, nickel, zinc and cadmium are certainly adsorbed in their free ionic form, even when both hydroxide species and free ionic farms are responsible for the removal of copper and chromium. However, removal affinity order separates easily hydrolyzable ions from less hydrolyzable ions.

Keywords: Coal Fly Ash, Removal, pH, Sorption, Metallic Ions Speciation, Hexavalent Chromium, Sorption, Adsorption, Oxides, Chitosan, Samples, System, Waste

Özer, A., Tanyildizi, M.S. and Tümen, F. (1998), Study of cadmium adsorption from aqueous solution on activated carbon from sugar beet pulp. *Environmental Technology*, **19** (11), 1119-1125.

Full Text: [E\Env Tec19, 1119.pdf](E/Env%20Tec19,%201119.pdf)

Abstract: The adsorption ability of activated carbons from sugar beet pulp to remove the cadmium from aqueous solutions has been investigated. Optimum temperature and time for carbonization of sugar beet pulp were determined as 700°C and 120 min. The results of adsorption experiments show that pH for effective removal of cadmium was 6.3 or greater. The maximum removal percentage of cadmium were found to be 99.0, 78.2 and 57.0 by using 2.5 g l-1 adsorbent dosage for initial cadmium concentration of 100, 250 and 500 mg l-1, respectively, at optimum pH and 20°C for a contact time of 120 min. Langmuir and Freundlich adsorption models were applied to the isotherm data. The free energy change of process was found to be -18.03 kJ mol-1.

Keywords: Cadmium Removal, Sugar Beet Pulp, Carbonization, Adsorption, Adsorption Isotherm, Removal

Kleiman, I.D. and Cogliatti, D.H. (1998), Chromium removal from aqueous solutions by different plant species. *Environmental Technology*, **19** (11), 1127-1132.

Full Text: [E\Env Tec19, 1127.pdf](E/Env%20Tec19,%201127.pdf)

Abstract: The aim of this study was to evaluate the potential efficiency of three plant species to remove chromium from wastewaters. Wheat (Triticum aestivum), rape (Brassica napus var. Oleracea) and buckwheat (Fagopyrum esculentum) were grown hydroponically under controlled conditions. The uptake of Cr(III) and Cr(VI), and its effect on plant growth were measured in culture solution. Cr(VI) was more toxic than Cr(III). In all species, Cr(III) affected growth only at the highest concentration, while Cr(VI) was toxic at lower concentrations. Plant Cr-concentration was far higher in the root than in the shoot of the three plant species grown with both Cr(III) or Cr(VI). Plants grown in Cr(III) showed higher tissue concentration and chromium removal efficiency than those grown in Cr(VI). In Cr(III), Cr-oxide and hydroxide precipitation on root surface was observed. It can be suggested that plant roots act as a powerful agent of Cr(III) removal and thai a greater amount of plant roots would be necessary to remove Cr(VI) rather than Cr(III). Buckwheat was the most efficient species at removing and plants were able to retain their capacity for Cr-removal even though they may have shown strong toxicity symptoms.

Keywords: Chromium Removal, Cr(III), Cr(VI), Wastewater, Terrestrial Plants, Heavy-Metals, Absorption, Seedlings

? Lee, C.K., Low, K.S. and Gan, P.Y. (1999), Removal of some organic dyes by acid-treated spent bleaching earth. *Environmental Technology*, **20** (1), 99-104.

Full Text: [1999\Env Tec20, 99.pdf](1999/Env%20Tec20,%2099.pdf)

Abstract: Aid treated spent bleaching earth was prepared by treating spent bleaching earth, a waste material from the palm oil industry, with 20% sulphuric acid and heated at 350 degrees C for three hours. This material can efficiently sorb a variety of organic dyes especially reactive and acid dyes, with maximum sorption capacity in the order of 2-300 mg g(-1). The applicability of both the Langmuir and Freundlich isotherms to the experimental data indicates that both physicosorption and chemisorption were involved in the sorption process.

Keywords: Acid Treated Spent Bleaching Earth, Reactive Dyes, Acid Dyes, Sorption, Adsorbent, Clay

? Yu, Q. and Kaewsarn, P. (1999), Fixed-bed study for copper(II) removal from aqueous solutions by marine alga *Durvillaea potatorum*. *Environmental Technology*, **20** (9), 1005-1008.

Full Text: [1999\Env Tec20, 1005.pdf](1999/Env%20Tec20,%201005.pdf)

Abstract: A systematic study of fixed-bed adsorbers was carried out by using pre-treated biomass of marine alga Durvillaea potatorum as a biosorbent for the removal of copper(II) from aqueous solutions. The effects of particle size, influent concentration, flow rate and column length on the breakthrough curves were investigated. nle study indicated that the pre-treated biomass can be used as an efficient biosorbent in fixed-bed operations for the treatment of copper(II) bearing waste water streams. Smaller particles reduced film mass transfer resistances and the intraparticle diffusion paths. Higher influent concentrations resulted in sharper breakthrough curves. A constant pattern breakthrough curve was observed as the column length was of sufficient length.

Keywords: Biosorption of Heavy Metals, Fixed-Bed Operation, Copper(II) Removal, Durvillaea Potatorum, Marine Algae, Metal-Ions, Biosorption, Biomass, Cadmium

Lin, S.H. and Lin, R.C. (1999), Adsorption and mass transfer characteristics of pentane and cyclopentane by various adsorbents. *Environmental Technology*, **20** (1), 11-19.

Full Text: [E\Env Tec20, 11.pdf](E/Env%20Tec20,%2011.pdf)

Abstract: Experiments have been conducted to investigate gas-phase adsorption characteristics of pentane and cyclopentane by activated carbon fiber (ACF), extruded activated carbon (EAC), granular activated carbon (GAC), activated alumina and molecular sieve. Pentane and cyclopentane are currently regarded as excellent replacements for CFC-11, a foaming agent used extensively in the soft and rigid polyurethane foam industries. Adsorption performances of pentane and cyclopentane were characterized by the equilibrium adsorption capacity, time to reach equilibrium and desorption efficiency of exhausted adsorbent. A simple thermal treatment process with proper operating temperature and treatment duration was found to be effective for pretreatment of fresh adsorbents and regeneration of exhausted ones. Adsorption isotherms of the empirical Freundlich and Jossens types were observed to represent quite well the present equilibrium adsorption. A mass transfer model based on the pseudo steady state squared driving force was adopted to describe the mass transfer process of the pentane and cyclopentane adsorption.

Lee, C.K., Low, K.S. and Gan, P.Y. (1999), Removal of some organic dyes by acid-treated spent bleaching earth. *Environmental Technology*, **20** (1), 99-104.

Full Text: [E\Env Tec20, 99.pdf](E/Env%20Tec20,%2099.pdf)

Abstract: Aid treated spent bleaching earth was prepared by treating spent bleaching earth, a waste material from the palm oil industry, with 20% sulphuric acid and heated at 350°C for three hours. This material can efficiently sorb a variety of organic dyes especially reactive and acid dyes, with maximum sorption capacity in the order of 2-300 mg g-1. The applicability of both the Langmuir and Freundlich isotherms to the experimental data indicates that both physicosorption and chemisorption were involved in the sorption process.

Keywords: Acid Treated Spent Bleaching Earth, Reactive Dyes, Acid Dyes, Sorption, Adsorbent, Clay

Johansson, L. (1999), Industrial by-products and natural substrata as phosphorus sorbents. *Environmental Technology*, **20** (3), 309-316.

Full Text: [E\Env Tec20, 309.pdf](E/Env%20Tec20,%20309.pdf)

Abstract: The efficiency of phosphorus (P) removal in ecologically-engineered wastewater treatment facilities, such as artificial wetlands and sand filters, can be improved by using a reactive sorbent. The sorbent must therefore have a high P-sorption capacity and an adequate hydraulic conductivity. Several filter materials have been tested here in regard to their P-sorption capacity. In this study, three natural materials - opoka (a bedrock found in south-eastern Poland) limestone and the B horizon of a forest soil, plus two artificial materials - blast furnace slag (crystalline and amorphous, in two particle sizes (0-0.125 mm and 0.25-4 mm), and fly ash were investigated. Phosphate sorption and isotherm studies were performed. In addition, physical and chemical properties of the materials were also investigated. The P-sorption experiment showed that all materials were capable of sorbing P to various extents. The coarse crystalline slag had the highest P-sorption capacity followed in order by the fine crystalline slag, the fine amorphous slag, the B horizon, the limestone, the coarse amorphous slag, the ash and the opoka. The isotherm studies showed that the B horizon was the most efficient P retainer, followed in order by the coarse crystalline slag,the fine crystalline slag, the fine amorphous slag and the coarse amorphous slag, with opoka and limestone showing the poorest retention. It was concluded that the crystalline slags had the highest P-sorption capacities, and that coarse crystalline slag possessed the highest hydraulic conductivity, suggesting that this material is the most suitable for use in ecological wastewater treatment systems.

Keywords: Ecologically-Engineered Treatment Systems, Phosphorus Removal, Slag, Sorbent Material, Constructed Wetlands, Waste-Water, Removal, Phosphate, Retention

Günaydin, F., Özer, A., Altundogan, H.S., Erdem, M. and Tümen, F. (1999), The removal of Cr(VI) from aqueous solutions using zinc extraction residue. *Environmental Technology*, **20** (4), 405-411.

Full Text: [E\Env Tec20, 405.pdf](E/Env%20Tec20,%20405.pdf)

Abstract: This study deals with the removal of Cr(VI) from aqueous solutions by using filter cake known as zinc extraction residue (ZER) generated as a by product in a zinc production plant located in Kayseri-TURKEY. It was found that ZER, which is rich in lead compounds, has a great affinity for chromate ions. The Cr(VI) removal yield decreased with increasing initial concentration of Cr(VI) solution. An increase in the dosage of ZER caused an increase in the removal yield and the concentration of Pb, Cd and Zn released from ZER into the heated solution. The effect of temperature showed the removal process is endothermic. The removal process was highly pH dependent. 100 lo removal of Cr(VI) was obtained at initial pH about 5.0 and 11.0 for the initial Cr(VT) concentration of 100 mg l-1 at 25°C and 5 mg l-1 ZER dosage for contact time of 60 min. The removal percentage of Cr(VI) declined at pHs other than those mentioned above. Minimum removal (26.5 %) was observed at initial pH value of 3.05. XRD analysis showed that low-solubility lead chromates were formed in the removal process.

Keywords: Cr(VI) Removal, Zinc Extraction Residue, Lead-Filter Cake, Heavy Metal

Shen, Y.H. and Yen, M.H. (1999), Sorption of nonionic surfactants on soil. *Environmental Technology*, **20** (4), 425-430.

Full Text: [E\Env Tec20, 425.pdf](E/Env%20Tec20,%20425.pdf)

Abstract: Experiments in batch soil/aqueous systems were conducted to evaluate the important physical-chemical factors determining the sorption of nonionic surfactants onto natural soil. An understanding of this is valuable to the application of nonionic surfactants for soil washing and enhanced subsurface remediation. Sorption data were found to follow a Langmuir type isotherm reaching a saturation maximum over 10000 mg l-1 solution concentration of surfactant. The hydrophilic ethylene oxide portion of nonionic surfactants plays a more important role in determining the extent of sorption by soils than the hydrophobic hydrocarbon chain portion. Sorption capacity of nonionic surfactants for soils appears to be related to the mineralogical composition of the soil surface, soil organic carbon content, ionic strength and solution pH.

Keywords: Nonionic Surfactant, Sorption, Soil Remediation, Adsorption, Solubilization, Remediation, Sediments, Clays

Gerente, C., Andres, Y. and Le Cloirec, P. (1999), Uranium removal onto chitosan: Competition with organic substances. *Environmental Technology*, **20** (5), 515-521.

Full Text: [E\Env Tec20, 515.pdf](E/Env%20Tec20,%20515.pdf)

Abstract: Organic materials and especially humic substances are often present in natural waters. The influence of organic compounds on uranium removal onto chitosan is studied. The pH of the media is fixed at 6. In operating conditions, uranium major species present in solution are: (UO2)3(OH)5+. and (UO2)4(OH)7+. Capacity of fixation is found to be 450 mg g-1, considering precipitation phenomena. Experimental results show that chitosan offers a selective adsorption depending on the different organics used: the adsorption capacity is maximum with benzaldehyde, average with humic acids, limited with phenol and insignificant with benzoic acid. Phenol does not affect the fixation capacity of uranium significantly whereas benzoic acid and benzaldehyde have an average effect upon it and humic acids decrease it to 200 mg g-1 and less as the concentration of the acid increases.

Lau, P.S., Lee, H.Y., Tsang, C.C.K., Tam, N.F.Y. and Wong, Y.S. (1999), Effect of metal interference, pH and temperature on Cu and Ni biosorption by *Chlorella vulgaris* and *Chlorella miniata*. *Environmental Technology*, **20** (9), 953-961.

Full Text: [E\Env Tec20, 953.pdf](E/Env%20Tec20,%20953.pdf)

Abstract: *Chlorella vulgaris*, an unicellular green alga which had extensively been used for wastewater nutrient removal studies, and a locally isolated *Chlorella miniata* were assessed for their Cu and Ni biosorption from single and mixed metalsolutions. The locally isolated C. miniata had a higher maximal binding (qmax) of 23.26 mgCu g-1 d.w. and 20.37 mgNi g-1 d.w. than the 18.72 Cu g-1 d.w. and 12.06 mgNi g-1 d.w. of *C. Vulgaris* when unit biomass was concerned. However, when normalized to surface area of the cells, C. miniata showed a higher Ni but lower Cu biosorption than *C. Vulgaris*. Both Chlorella species had a preferential Cu to Ni biosorption from mixed metalsolutions. The Cu biosorption by both algal biomass was not significantly affected in the presence of 30 mgl-1 Ni. When Ni increased to 300 mgl-1, the qmax of Cu was reduced by 13% in *C. Vulgaris* and 7.7% in C. miniata. On the contrary, presence of 30 mgl-1 Cu already lowered the qmax of Ni by 12% and 17% in *C. Vulgaris* and C. miniata, respectively. and virtually, no Ni biosorption was observed in presence of 300 mgl-1 Cu. Optimal Cu and Ni biosorption was found at pH 6. Although temperature had a significant effect on the biosorption process, its impact was much less than that of pH and the interference effect of Cu in the case of Ni biosorption.

Keywords: Waste-Water, Heavy-Metal, Biomass, Adsorption, Removal, Lead, Alginate, arrhizus, Algae, Biosorption, Chlorella Algal Cells, Metal Interference, Temperature, pH, Surface Area

Demirel, B., Yenigün, O. and Bekbölet, M. (1999), Removal of Cu, Ni and Zn from wastewaters by the ferrite process. *Environmental Technology*, **20** (9), 963-970.

Full Text: [E\Env Tec20, 963.pdf](E/Env%20Tec20,%20963.pdf)

Abstract: Applicability of the ferrite process in industrial wastewater treatment was investigated in this study. Preliminary experiments were carried out on synthetic wastewater samples, bearing copper, nickel, and zinc cations, to determine the optimum experimental conditions providing ferrite formation and satisfactory metal removal rates from solutions. These conditions were then applied to copper industry wastewater with the same heavy metal cations, with higher concentrations. Experiments resulted in about 100 % removal of both copper and zinc, and 99.0 % removal of nickel at pH 11, 50°C, 1000 ml min-1 aeration, and 2 hours of oxidation, with the ratios of Cu2+: Fe2+ = 1: 4, Ni2+: Fe2+ = 1: 9, and Zn2+: Fe2+ = 1: 10 for this particular wastewater. As well as pH, contact time and Fe2+ concentration in solution were also significant in affecting ferrite formation and hence removal efficiencies of metals. Providing that the optimum conditions are satisfied, the ferrite process can successfully be applied to remove heavy metals from industrial wastewaters.

Lee, C.K., Low, K.S., Liew, S.C. and Choo, C.S. (1999), Removal of arsenic(V) from aqueous solution by quaternized rice husk. *Environmental Technology*, **20** (9), 971-978.

Full Text: [E\Env Tec20, 971.pdf](E/Env%20Tec20,%20971.pdf)

Abstract: The potential of using quaternized rice husk (QRH) as a sorbent for the removal of As(V) from aqueous solution was investigated. Both batch and column studies were carried out. Results of batch studies indicate that sorption was pH and temperature dependent. Equilibrium was attained within 20 minutes and sorption appeared to be essentially an ion exchange process. Experimental data could be fitted into the Langmuir isotherm with a maximum sorption capacity of 18.98 mg g-1 at pH 7.5 and 28±2°C. Anions such as SO42-and CrO42-interfere with the uptake of As(V) by QRH. In the column studies, results show that breakthrough depends on bed depth but not on flow rate as sorption was very rapid. In addition, service time at 50% breakthrough was inversely proportional to influent concentration and had a linear relationship with bed-depth.

Keywords: As(V), Oxyanion, Sorption, Isotherm, Quaternized Rice Husk, Activated Carbon, Adsorption, Water, Sorbent, Waste

Yu, Q. and Kaewsarn, P. (1999), Fixed-bed study for copper(II) removal from aqueous solutions by marine alga durvillaea potatorum. *Environmental Technology*, **20** (9), 1005-978.

Full Text: [E\Env Tec20, 1005.pdf](E/Env%20Tec20,%201005.pdf)

Abstract: A systematic study of fixed-bed adsorbers was carried out by using pre-treated biomass of marine alga *Durvillaea potatorum* as a biosorbent for the removal of copper(II) from aqueous solutions. The effects of particle size, influent concentration, flow rate and column length on the breakthrough curves were investigated. The study indicated that the pre-treated biomass can be used as an efficient biosorbent in fixed-bed operations for the treatment of copper(II) bearing waste water streams. Smaller particles reduced film mass transfer resistances and the intraparticle diffusion paths. Higher influent concentrations resulted in sharper breakthrough curves. A constant pattern breakthrough curve was observed as the column length was of sufficient length.

Guibaud, G., Baudu, M., Dollet, P., Condat, M.L. and Dagot, C. (1999), Role of extracellular polymers in cadmium adsorption by activated sludges. *Environmental Technology*, **20** (10), 1045-1054.

Full Text: [E\Env Tec20, 1045.pdf](E/Env%20Tec20,%201045.pdf)

Abstract: The heavy metal uptake in activated sludge process is generally explained by a phenomenon of biosorption which largely implicates the extracellular polymers (ECP). In order to confirm such a specific mechanism, cadmium adsorption has been determined onto raw activated sludges, activated sludges inactivated by azide and dinibrophenol, washed activated sludges, solutions of extracted polymers and activated sludges enriched with extracted polymers. The Freundlich equation allows description of the adsorption isotherm of Cd2+ onto activated sludges as onto extracted extracellular polymers for the range of residual cadmium concentration studied. The adsorption of cadmium is a physicochemical phenomenon. A competitive binding of cadmium appears between the ECP mainly free in supernatant and the ECP so-called ‘strongly attached to solids’. A speciation study of cadmium by polarography confirmed that the cadmium is entirely complexed by PEC in solution. This study underlines the complexity of interactions between cadmium and the components of the activated sludge.

Keywords: Activated Sludges, Cadmium, Adsorption, Extracellular Polymers, Competition, Pure Bacterial Culture, Heavy-Metals, Removal, Biosorption, Extraction, Desorption, Flocs

Bassi, R., Prasher, S.O. and Simpson, B.K. (1999), Remediation of metal-contaminated leachate using chitosan flakes. *Environmental Technology*, **20** (11), 1177-1182.

Full Text: [E\Env Tec20, 1177.pdf](E/Env%20Tec20,%201177.pdf)

Abstract: The objective of this study was to study, under various physicochemical conditions, the ability of chitosan to trap heavy metals leached during remedial. washing of contaminated soils with organic extractants. The contaminated soil was washed with 0.1 M citric acid, pH 5.5, for 24 h, producing a metal-rich leachate containing 0.06, 0.02, 0.003, and 5.87 µmolesml-1 of Zn, Cu, Cd, and Pb, respectively. Equilibrium and kinetic sorption studies revealed that chitosan significantly reduced the levels of these metal ions in the leachate. A 12 h mixing of the leachate with chitosan flakes resulted in about 50% reduction in metal ion contents of the leachate. However, the adsorption of metal ions by the chitosan was found to depend on the relative concentrations of metal ions present in the leachate. The mass of chitosan required for achieving adsorption equilibrium was consequently dependent on the initial concentrations of metal ions. Reduction in metal ion contents of the leachate by chitosan flakes did not appear to be significantly improved by agitation. In addition, heavy metal removal by chitosan was found to be highest at pH 6.0. Results from the experiments involving replacement of metal-laden chitosan with fresh chitosan suggested that at least four replacements of chitosan would be required for absolute remediation of the leachate.

Keywords: Organic-Acids, Heavy-Metals, Adsorption, Beads, Sorption, Chitosan, Heavy Metals, Adsorption, Remediation, Citric Acid

Couturas, S., Bourgeois, S. and Bermond, A. (2000), A critical study of the use of hydrogen peroxide to determine trace metals bound to soil organic matter. *Environmental Technology*, **21** (1), 77-86.

Full Text: [E\Env Tec21, 77.pdf](E/Env%20Tec21,%2077.pdf)

Abstract: The risk due to the presence of large amounts of trace metals in soils is related strongly to their speciation, which is usually estimated by sequential extraction procedures. However, this approach is now very controversial. As one of the soil compartments responsible for the trace metal fixation is the organic matter, the aim of this work was to study the reliability of the use of a chemical reagents such as hydrogen peroxide in determining the trace metal quantities bound to the soil organic matter. A comparison of the quantities of trace metals extracted by H+ or H+ + H2O2 for different values of the final pH, has shown that an optimal pH is required in order to provide the best estimate of trace metals bound to soil organic matter, when using for this goal the hydrogen peroxide, Using this approach, we found for example that more than 60% of copper is truly bound to organic matter.

Keywords: Sequential Extraction Procedures, Heavy-Metals, Sediments, Speciation, Fractionation, Adsorption

Önkal-Engin, G., Wibulswas, R. and White, D.A. (2000), Humic acid uptake from aqueous media using hydrotalcites and modified montmorillonite. *Environmental Technology*, **21** (2), 167-175.

Full Text: [E\Env Tec21, 167.pdf](E/Env%20Tec21,%20167.pdf)

Abstract: Humic add occurs in waters naturally. Humic add gives its characteristic yellowish to brownish colour to water making it unaesthetic. In this study, synthetic hydrotalcite, hydrotalcite-like compounds, calcined hydrotalcites and modified forms of Montmorillonite were used to remove humic acid from water. The results indicated that surfactant treated Montmorillonite was more effective than other forms of modified Montmorillonite. In the case of hydrotalcites, hydrotalcite-like compounds removed more humic add than synthetic hydrotalcite. Surfactant created Montmorillonite, however, was found to be a better adsorbent when compared to other day samples.

Keywords: Hydrotalcites, Montmorillonite Clays, Humic Acid, Adsorption, Pillared Clays, Thermal-Stability, Removal, Water, Adsorption

Vaxelaire, J., Mousques, P., Bongiovanni, J.M. and Puiggali, J.R. (2000), Desorption isotherms of domestic activated sludge. *Environmental Technology*, **21** (3), 327-335.

Full Text: [E\Env Tec21, 327.pdf](E/Env%20Tec21,%20327.pdf)

Abstract: Most of the studies dealing with water repartition within activated sludge focus essentially on the transition between flee water and bound water, a transition which is important for mechanical dewatering investigations. But nowadays the drying of sludge is increasing and a better characterisation of the bound water is necessary. In this study a simple technique for the evaluation of sorption isotherms is presented. The experimental data obtained from this method indicate that flocculation and dewatering by filtration-compression (up to 10 bar) do not affect the distribution of the bound water. Otherwise usual models such as BET or GAB equations give a good representation of the desorption isotherms of activated sludge and allow an estimation of the adsorption heat of the water. The comparison of the experimental results (in terms of transition moisture content and specific area) with some data obtained from differential scanning calorimetry and porometry experiments shows a relatively good agreement between the different methods of evaluation and then validates the presented technique.

Keywords: Bound Water, Water Activity, Adsorption Heat, BET, GAB, Bound Water-Content

Ha, S.R. and Vinitnantharat, S. (2000), Competitive removal of phenol and 2,4-dichlorophenol in biological activated carbon system. *Environmental Technology*, **21** (4), 387-396.

Full Text: [E\Env Tec21, 387.pdf](E/Env%20Tec21,%20387.pdf)

Abstract: Laboratory scale experiments were conducted to evaluate the removal capacities of the major competitive components in a biological activated carbon (BAC) system. Adsorption, desorption, biodegradation, biosorption, and bioregeneration were considered as the major target reactions. Phenol and 2,4-dichlorophenol were used in a single and bisolute system. The adsorption experiment showed that 2,4-dCP was a stronger adsorbate than phenol both in single and bisolute systems. On desorption of 2,4-dCP, the small fraction of sorbed compounds was reversible but phenol had comparatively high reversibility. All solutions exhibited high degrees of irreversible adsorption as hysteresis. Desorption in background organics showed high reversibility. The biomass sorptions of phenol and 2,4-dCP were both negligible so that the removal of these compounds could be disregarded in the BAC system. Meanwhile, the biodegradation of phenol was higher than that of 2,4-dCP in both as a single and bisolute systems. The biodegradation of phenol was higher than that of 2,4-dCP in both single and bisolute systems. Although, the biodegradation capability of phenol was suppressed in the presence of 2,4-dCP but it induced the biodegradation of 2,4-dCP. In single solute, the degree of bioregeneration in terms of phenol and 2,4-dCP in single solute were 76.28% and 56.80%, respectively. In bisolute system, they were 74.46% and 60.20% for phenol and 2,4-dCP, respectively and degree of bioregeneration was corresponding to degree of hysteresis.

Lin, S.H. and Cheng, M.J. (2000), Phenol and chlorophenol removal from aqueous solution by organobentonites. *Environmental Technology*, **21** (4), 475-482.

Full Text: [E\Env Tec21, 475.pdf](E/Env%20Tec21,%20475.pdf)

Abstract: Experimental investigations were conducted on the adsorption characteristics of phenol and m-chlorophenol by organobentonites. The organobentonites were prepared by modifying the natural bentonite by various quaternary amines including tetramethylammonium bromide (TMAB), hexadecyltrimethylammonium bromide (HDTMAB) benzyltriethylammonium bromide (BTEAB), tetraethylammonium bromide (TMAB) and cetylpyridinium bromide (CPB), all surfactants. The empirical Freundlich isotherm was found to describe well the equilibrium adsorption data. Multistage adsorption of phenol or chlorophenol by organobentonites was investigated both theoretically and experimentally. Theoretical equations were found to predict reasonably well the observed data. Preliminary regeneration of the exhausted organobentonites was also attempted. Results from several test runs showed the potential of regeneration by a simple thermal method.

Keywords: Organo-Clays, Exchanged Clays, Sorption, Water, Adsorption, Pollutants, Cosorption, Bentonite, Phenol Adsorption, Organobentonites, Multistage Process, Regeneration

Morais, L.C., Goncalves, E.P., Vasconcelos, L.T. and Beca, C.G.G. (2000), Reactive dyes removal from wastewaters by adsorption on eucalyptus bark: Adsorption equilibria. *Environmental Technology*, **21** (5), 577-583.

Full Text: [E\Env Tec21, 577.pdf](E/Env%20Tec21,%20577.pdf)

Abstract: As research previously carried out with eucalyptus bark to remove reactive dyes in aqueous solution showed that it had interesting adsorption capacities [1, 2], it was decided to continue this investigation. Adsorption equilibria studies in order to optimize the experimental conditions were done. As it was already known that the highest adsorption capacities were observed at room temperature and that among all the other studied parameters that could influence the equilibrium (pH, temperature and both initial dye, sodium chloride and bark concentration) pH had a high significance level (1% in the Fisher test) [2] and was an easily adjustable variable in industrial practice, it was decided to carry out adsorption equilibria studies parametered by initial pH. Because the above mentioned studies [1, 2] had shown that there should be a maximum adsorption capacity near initial pH 2 for the chosen values of the selected parameters that influence adsorption equilibria besides initial pH, the last variable, initial pH (pH(i)), was explored for pH 1.50-2.50. Confirmation that, under these circumstances, the maximum adsorption capacity occurred at initial pH 2.0 was demonstrated. Langmuir model fitted the isotherms individually very well. A trial to generalize this model to all the isotherms having Langmuir parameters expressed as a function of the initial hydrogen ion activity, H-a(i)+, only succeeded for pH range, (1.50, 1.89) that is to say, just for one of the sides of the curve adsorption capacity = f(H-a(i)+) As the parameters of Langmuir equation, Q and K-L, vary in opposite senses with initial pH, it is thought that for the successful side of the curve, Q probably has predominant influence, while on the other side K-L may have greater importance.

Keywords: Adsorption, Adsorption Equilibria, Bark, Dye, Dyes, Eucalyptus Bark Adsorbent, Langmuir, Reactive Dyes, Reactive Dyes Removal, Removal

Marshall, W.E., Wartelle, L.H., Boler, D.E. and Toles, C.A. (2000), Metal ion adsorption by soybean hulls modified with citric acid: A comparative study. *Environmental Technology*, **21** (6), 601-607.

Full Text: [E\Env Tec21, 601.pdf](E/Env%20Tec21,%20601.pdf)

Abstract: Soybean hulls, extracted with 0.1 N NaOH (BE) and modified in the presence of 0.6 M citric acid (CA), were compared to similarily treated peanut shells and the hulls of almonds, cottonseed and macadamia nut for their ability to adsorb copper ion (Cu2+) as a typical metal ion. BE, CA-modified soybean hulls had the highest metal ion adsorption but similarly treated almond hulls had the highest total negative charge. BE, CA-modified soybean hulls also were compared to BE hulls modified in the presence of 0.6 M concentrations of four different dicarboxylic acids (maleic, malic, succinic, tartaric) for their copper ion adsorption potential. Hulls modified with CA had the highest adsorption of copper ion by virtue of their largest total. negative charge. Adsorption capacities and affinity constants for the metal ions cadmium (Cd2+) copper (Cu2+), nickel (Ni2+), lead (Pb2+) and zinc (Zn2+) were determined for BE, CA-modified hulls at pH 4.8. Adsorption capacities for all ions were greater than 1.0 mmol g-1 hull. These hulls were compared to two commercial cation exchange and two commercial chelating resins for adsorption of the live metals at three metal ion concentrations either in a solution containing all five ions or as individual metals. When all five metal ions were present at the highest concentration (7 mM), modified soybean hulls removed more metal ions than any of the commercial products. For individual metal ions, all adsorbents generally were quite effective at metals removal at the three concentration levels. Our comparative results demonstrate that modified soybean hulls have excellent metals removal properties and can be considered as a product with possible commercial potential for metal ion remediation.

Keywords: Acids, Adsorbents, Adsorption, Agricultural By-Products, Almond, Binding-Properties, Ca, Cadmium, Citrate, Citric Acid, Concentration, Copper, Corn Protein Products, Cu2+, Dicarboxylic Acids, Exchange Properties, Granular Activated Carbons, Ion, Lead, Metal Ion Adsorption, Metals, Nickel, Peanut, pH, Products, Properties, Remediation, Resins, Sodium Hydroxide, Soybean Hulls, Zinc

Denizli, A., Büyüktuncel, E., Tuncel, A., Bektas, S. and Genç, Ö. (2000), Batch removal of lead ions from aquatic solutions by polyethyleneglycol-methacrylate gel beads carrying cibacron blue F3GA. *Environmental Technology*, **21** (6), 609-614.

Full Text: [E\Env Tec21, 609.pdf](E/Env%20Tec21,%20609.pdf)

Abstract: Polyethyleneglycolmethacrylate [PEG-MA] gel beads (100-120 µm in diameter) carrying Cibacron Blue F3GA (42.6 µmol g-1 polymer) were prepared for the removal of Pb(II) ions from aqueous solutions containing different amount of these ions (10-600 mg l-1) and at different pH values (2.0-6.4). Pb(II) adsorption capacity increases with the time during the first 20 min and then levels off toward the equilibrium adsorption capacity. Adsorption of Pb(II) ions on the unmodified PEG-MA gel beads was zero. Cibacron Blue F3GA-immobilisation significantly increased the Pb(II) adsorption (23.3 mg g-1 polymer). Langmuir adsorption model was found to be applicaple in interpreting lead adsorption by Cibacron Blue F3GA-immobilised PEG-MA gel beads. The adsorption of Pb(II) ions increased with increasing pH and reached a plateau value at around pH 5.0. The optimal pH range for Pb(II) adsorption was shown to be from 5.0 to 6.0. PEG-MA gel beads can be regenerated by washing with a solution of nitric acid (0.1 M). The maximum regeneration value was as high as 98%. These PEG-MA gel beads are suitable for repeated use for more than three adsorption-desorption cycles without considerable loss of adsorption capacity.

? Dos Santos, M.C. and Lenzi, E. (2000), The use of aquatic macrophytes (*Eichhornia crassipes*) as a biological filter in the treatment of lead contaminated effluents. *Environmental Technology*, **21** (6), 615-622.

Full Text: Env Tec21, 615.pdf

Abstract: The use of aquatic macrophytes (*Eichhornia crassipes*) as a biological filter in the elimination of lead from industrial effluents was tested experimentally in greenhouses. Variables studied and optimized were ratio (r) mass of wet water hyacinth in grams per volume of contaminated solution in liters where it was found that the best intervals ranged from 40 to 50 g l-1, best value of lead concentration in contaminated solution in which water hyacinth had greater de-pollution efficiency up to 30 mg l-1; the first 12 hours constitute the best period of contact of water hyacinth with solution. The method was applied to an effluent of a battery industry. Add pH of effluent was corrected to 7, temperature ranged from 20°C td 25°C, at 1 atm. After neutralization of effluent (4.45 mg l-1) lead concentration was removed with 99% efficiency when optimizing conditions were achieved.

Keywords: Water Hyacinth (Eichhornia Crassipes), Biological Filter, Heavy Metal, Industrial Effluents,Water Hyacinth, Removal

? Kuh, S.E. and Kim, D.S. (2000), Removal characteristics of cadmium ion by waste egg shell. *Environmental Technology*, **21** (8), 883-890.

Full Text: Env Tec21, 883.pdf

Abstract: Waste egg shell is used as adsorbent to treat cadmium bearing wastewater. Characteristics of cadmium ion removal by egg shell in synthetic wastewater was investigated for various parameters. This study shows the effect of reaction time, the amount of egg shell, concentration of cadmium ion, the size of egg shell, temperature and solution pH on the extent of cadmium ion adsorption from solution. Adsorption increased with the increase in reaction time, the amount of egg shell, temperature and pH. But the amount of adsorption decreased according to the increase in the egg shell size. This study also examines the adsorption isotherm and reaction kinetics for cadmium ion. The adsorption process was found to have a tendency to be endothermic and the adsorption isotherms for cadmium ion could be fitted closely by the Freundlich model.

Keywords: Egg Shell, Cadmium Ion, Adsorption, Freundlich Adsorption Isotherm, Reaction Kinetics, Adsorption, Montmorillonite, Goethite

Aoyama, M., Seki, K., Kasai, A., Kurimoto, Y., Chen, K. and Doi, S. (2000), Removal of inorganic mercury from aqueous solutions by carbonized waste newsprint fiber. *Environmental Technology*, **21** (9), 1013-1018.

Full Text: [E\Env Tec21, 1013.pdf](E/Env%20Tec21,%201013.pdf)

Abstract: The ability of carbonized waste newsprint fiber to remove Hg(II) from aqueous solutions by physicochemical adsorption was investigated. Defiberized waste newsprint was carbonized in a nitrogen atmosphere at temperatures ranging 600 to 900°C for 3 h. Research parameters included carbonization temperature, initial solution pH, contact time, solution temperature, and initial concentration of Hg(II). The studies showed the adsorbents to be an efficient adsorbent for removing Hg(II) from aqueous solutions. Of the parameters studied, carbonization temperature and initial solution pH were considered to be the most crucial. The amount of Hg(II) adsorbed onto the adsorbent increased with increasing carbonization temperature in the pH range 3 to 9, while it decreased as the temperature increased at pH 11. The extent of the adsorption was also dependent upon the contact time, solution temperature, and initial concentration of Hg(II). The adsorption data were well fitted to both the Freundlich and Langmuir isotherms. Desorption studies imply the occurrence of strong interaction of the Hg(II) species with the active sites on the surface of the adsorbent.

Kadirvelu, K. and Namasivayam, C. (2000), Agricultural by-product as metal adsorbent: Sorption of lead(II) from aqueous solution onto coirpith carbon. *Environmental Technology*, **21** (10), 1091-1097.

Full Text: [E\Env Tec21, 1091.pdf](E/Env%20Tec21,%201091.pdf)

Abstract: Activated carbon prepared from coirpith waste was used for the adsorptive removal of Pb(II) from aqueous solution. Parameters such as agitation time, metal ion concentration, adsorbent dose and pH were studied. Adsorption equilibrium was reached in 30 min for solution containing 25 and 50 mg l-1 and 40 min for solution containing 75 and 100 mg l-1 Pb(II), respectively. Adsorption parameters were determined using both Langmuir and Freundlich models. The adsorption capacity was 263 mg g-1. Pb(II) removal increased with increased pH from 2 to 4 and remained constant up to pH 10. Desorption studies were also carried out with dilute hydrochloric add to recover both carbon and Po(II). As the raw material for the preparation of activated carbon is discarded as waste during coir processing, the production of this carbon is expected to be economically feasible.

Keywords: Carbonised Coirpith, Adsorption, Lead(II), Isotherms, Kinetics, pH, Desorption, Industry Waste-Water, Activated Carbon, Heavy-Metals, Removal, Ions, Adsorption, Binding, Cadmium, Copper, Husks

Low, K.S., Lee, C.K., Wong, S.Y. and Tang, P.L. (2000), Metal soprtion enhancement of rice hull through chemical modification. *Environmental Technology*, **21** (11), 1239-1243.

Full Text: [E\Env Tec21, 1239.pdf](E/Env%20Tec21,%201239.pdf)

Abstract: Various chemical modifications were attempted on rice hull in order to improve its metal sorption capacity. Ethylenediamine tetraacetic acid (EDTA) was found to give the greatest enhancement. Parameters investigated include pH, initial concentration, sorbent dosage and competition with other cations and chelators. Sorption was pH dependent with greater uptake at higher pH value. Equilibrium was attained in less than 60 minutes implying the material could be suitable for continuous flow system. Maximum sorption capacities of EDTA-modified rice hull were 8.86, 9.59, 8.76 and 28.65 mg g-1 for Cu(II), Cr(III), Ni(II), and Pb(II) respectively. The presence of EDTA and nitrilotriacetic add (NTA) suppressed the metal binding capacity of EDTA-RH. Column study on the removal of Cu(II) from wood preservative waste showed that the removal of Cu(II) was a function of bed-depth.

Keywords: Acid, Biomass, Chemical Modification, Chemical Modifications, Copper, Ions, Metal, Metal Sorption, Modification, Removal, Rice Hull, Sorbent, Sorption, Waste, Waste-Water, Wood

Hasar, H. and Cuci, Y. (2000), Removal of Cr(VI), Cd(II), and Cu(II) by activated carbon prepared from almond husk. *Environmental Technology*, **21** (12), 1337-1342.

Full Text: [E\Env Tec21, 1337.pdf](E/Env%20Tec21,%201337.pdf)

Abstract: Activated carbon was prepared from almond husk by activating with and without H2SO4 at different temperatures. The ability of the activated carbon to remove some metal ions from aqueous solutions by adsorption has been investigated under several conditions such as carbonisation temperature of husk, concentration of metal ions, contact time, and adsorbent dosage. Optimum contact time was found to be 180 minutes for an initial concentration of 100 mg 1 at 5 g of adsorbent per 100 ml. The results showed that effective metal ions on the activated carbon was obtained by adding H2SO4 at 700 degreesC at the optimal conditions, the removal of Cr(VI), Cd(II), and Cu(II) were found to be 94.4, 93.7, and 94.7%, respectively. The Freundlich constants were calculated at differential initial concentrations under optimal conditions.

Keywords: Removal, Heavy Metal, Adsorption, Almond Husk, Coconut Husk, Waste-Water, Sorption, Copper, Metals, Moss

Inglezakis, V.J., Papadeas, C.D., Loizidou, M.D. and Grigoropoulou, H.P. (2001), Effects of pretreatment on physical and ion exchange properties of natural clinoptilolite. *Environmental Technology*, **22** (1), 75-82.

Full Text: [E\Env Tec22, 75.pdf](E/Env%20Tec22,%2075.pdf)

Abstract: Four pretreatment procedures have been applied to natural clinoptilolite to establish the influence of the pretreatment process on the properties of the material under investigation. Modification of material properties is imposed for its use in wastewater treatment via ion exchange processes. Batch pretreatment procedures as well as continuous flow column have been studied by using sodium chloride, sodium hydroxide and nitric acid solutions in deionized water. Measurements of the effective opacity, the diffusion coefficient in the solid state and examination of the crystal structure have been employed to assess the effect of each specific pretreatment on the material under test. The effective capacity is improved in all cases, by a factor of 2.4 to 3.6, while the diffusion coefficient values depend strongly on the type of pretreatment used and fall in the range of 0.03-1.37×10-8 cm2s-2 at 20 degreesC. The crystal structure remains unaltered as evidenced by XRD measurements.

Keywords: Clinoptilolite, Diffusion Coefficients, Effective Capacity, Ion Exchange, Lead, Pretreatment, Removal, Wastewater, Wastewater Treatment, Zeolites, Zeolites

Cioffi, R., Costanzo, S., Maffucci, L. and Santoro, L. (2001), Adsorption of the organic fraction of a tannery sludge by means of organophilic bentonite. *Environmental Technology*, **22** (1), 83-89.

Full Text: [E\Env Tec22, 83.pdf](E/Env%20Tec22,%2083.pdf)

Abstract: Two different organophilic bentonites obtained by cationic exchange with benzyldimethyloctadecylammonium chloride and trimethyloctadecylammonium chloride have been used to adsorb the organic fraction of a tannery sludge. The exchange process was carried out to different extents to obtain bentonite samples with different organophilicities and different interlayer spacings. Before adsorption, the organic matter was extracted by contacting the sludge with a Ca(OH)2, saturated solution. The adsorption capacity was found to increase with the amount of ammonium salt exchanged for both bentonites, but the one exchanged with benzyldimethyloctadecylammonium chloride proved to be more active: up to about 80% TOC could be removed from the contacting solution. The adsorption of the organic matter caused a further increase of the bentonite interlayer spacing. In both cases, the adsorption isotherms were found to be of cooperative type, due to weak adsorbent-adsorbate interactions at low loading followed by increasing adsorbate-adsorbate interactions at increasing loading. The results may be applied to tannery sludge stabilization by cementitious systems.

Keywords: Tannery Sludge, Organophilic Bentonite, Adsorption, Organic Waste, Stabilization, Hydrophobic Layer Silicates, Alcohol-Benzene Mixtures, Stabilization-Solidification, Industrial-Wastes, Clay-Minerals, Hazardous Wastes, Adsorbents, Isotherms, Sorption, Surface

Wu, F.C., Tseng, R.L. and Juang, R.S. (2001), Adsorption of dyes and phenols from water on the activated carbons prepared from corncob wastes. *Environmental Technology*, **22** (2), 205-213.

Full Text: [E\Env Tec22, 205.pdf](E/Env%20Tec22,%20205.pdf)

Abstract: Pore structures and physical properties of the activated carbons prepared from corncob wastes at various activation temperatures (830, 860, 890 degreesC.) were first studied. Equilibria and rates of adsorption of two commercial dyes, phenol, and 3-chlorophenol from water on such activated carbons were then measured at 30 degreesC. All adsorption isotherms of the solutes could be well fitted by the Langmuir equation. Three simplified kinetic models including pseudo-first-order equation, pseudo-second-order equation, and intraparticle diffusion model were selected to follow the adsorption processes. It was shown that the adsorption of both phenols could be best described by the pseudo second-order equation, but that of both dyes best by the intraparticle diffusion model. Kinetic parameters of each best-fit model were calculated and discussed.

Keywords: Activated Carbons, Preparation, Corncob, Adsorption Isotherms and Kinetics, Dyes, Phenols, Aqueous-Solutions, Intraparticle Diffusion, Kinetics, Equilibrium, Sorption, Removal, Cost, Dyestuffs, Adsorbents, Sorbents

Pikkov, L., Kallas, J., Ruutmann, T. and Rikmann, E. (2001), Characteristics of activated carbon produced from biosludge and its use in wastewater post-treatment. *Environmental Technology*, **22** (2), 229-236.

Full Text: [E\Env Tec22, 229.pdf](E/Env%20Tec22,%20229.pdf)

Abstract: Experimental research into the bench-scale production of activated carbon from waste-activated sludge from water purification, sawdust, pear, and their mixtures, by carbonisation and activation was undertaken. The research work was carried out to determine possible methods of production of cheap activated carbon from local raw materials and to use it in water purification technology. Along with the samples produced, several commercial activated carbons (namely RB-1, F 100. CA (adsorbent from military gas masks), BAY (product of the USSR)) were tested to compare adsorption properties in the adsorption of phenols, xylidines, amines, Methylene blue and molasses. It has been found that the activated carbon produced from waste biosludge was of higher quality than that produced from either sawdust or pest, and performed similarly to RE-land F100 in adsorption tests. It was also determined that the activated carbon produced from biosludge could possibly be used in the post-treatment of wastewater. Residual sludge from the biological treatment of the wastewater from the purification of oil-shale in the chemical processing industry could cover up to 80% of the need for activated carbon. Some of this activated carbon could be used in the post-treatment of the same water, adsorbing polyalcaline phenols from the initial content of 4mg l(1) to the demanded level of 1 mg l(1)

Keywords: Activated Carbon, Activated Carbons, Activation, Adsorbent, Adsorption, Biosludge, Manufacturing, Phenols, Quality, Sawdust, Wastewater

Yanardağ, R. and Orak, H. (2001), Total selenium concentration in various waters of Turkey. *Environmental Technology*, **22** (2), 237-246.

Full Text: [E\Env Tec22, 237.pdf](E/Env%20Tec22,%20237.pdf)

Abstract: The total selenium levels of 335 water samples of Turkey were determined by a spectrofluorometric method. The samples were digested in nitric-perchloric acid mixture, potential interferences were masked with disodium EDTA-HONH2. HCl and selenium was complexed with freshly prepared 2,3-diaminonaphthalene solution and estimated spectrofluorometrically after extraction in cyclohexane. The selenium content of various waters (rain, tap, mineral, sea, lake, river, bottled drinking waters and collected drinking waters from 42 cities in Turkey) were determined. The selenium levels were compared with the literature data from different countries.

Keywords: Selenium, Waters, Spectrofluorometry, Turkeyatomic-Absorption Spectrometry, Neutron-Activation Analysis, Cathodic Stripping Voltammetry, Hydride Generation, Natural-Waters, Trace-Elements, Serum Selenium, Environmental Waters, Blood Selenium, Drinking-Water

Lee, S.H., Song, D.I. and Jeon, Y.W. (2001), An investigation of the adsorption of organic dyes onto organo-montmorillonite. *Environmental Technology*, **22** (3), 247-254.

Full Text: [E\Env Tec22, 247.pdf](E/Env%20Tec22,%20247.pdf)

Abstract: Adsorption of organic dyes, crystal violet (CV), orange II (OR), and phenol red (PR), onto organo-clay was investigated in a batch type reactor at 25 degreesC. The organo-clay was obtained by modifying montmorillonite with a cationic surfactant, cetylpyridinium (CP), and used as an adsorbent. We conducted experiments to find out the effect of pH and solvent on the adsorption affinity of organic dyes for the modified montmorillonite. From the results, we observed that the adsorption capacity on the organo-montmorillonite decreased in the order CV > OR > PR at all pH values examined (pH 3, pH 7, and pH 11). It mostly resulted from the difference in solubility and the molecular weight of the solutes. In a 30-V/V % methanol/water cosolvent solution the adsorption capacity of the dyes decreased compared to that in aqueous solution. In addition, the adsorption capacities of OR and PR on CV-montmorillonite were lower than those on CP-montmorillonite. These results might show that partitioning by CP was superior to the adsorption by CV to hold the solute molecules on the surface of montmorillonite. The Langmuir and Redlich-Peterson (RP) models were used to represent the adsorption equilibria of the organic dyes.

Keywords: Adsorption, Montmorillonite, Cationic Surfactant, pH, Equilibrium, Sorption, Clays, Contaminants, Adsorbents, Chemicals, Removal, Cations

Yin, P., Yu, Q., Lin, Z. and Kaewsarn, P. (2001), Biosorption and desorption of cadmium(II) by biomass of Laminaria japonica. *Environmental Technology*, **22** (5), 509-514.

Full Text: [E\Env Tec22, 509.pdf](E/Env%20Tec22,%20509.pdf)

Abstract: Biosorption and desorption properties of cadmium(II) from aqueous solutions by the biomass of marine alga Laminaria japonica were investigated. Results indicated that the uptake capacities were solution pH dependent and a maximum uptake capacity of about 1.3 mmol g-1 (dry weight) was observed at pH 6. The adsorbed cadmium cannot be desorbed by distilled water, but it can be effectively recovered by using acidic or EDTA solutions. me equilibrium isotherms can be described well with the Langmuir adsorption equation. Biomass, pre-treated with calcium solution exhibited a higher (about 30%) uptake capacity and can be easily settled ham aqueous solutions. Batch kinetics experiments indicated that more than 90% of the adsorption occurred within 20 minutes of agitation and equilibrium was reached within one hour. Fixed-bed experiments showed similar uptake capacities to those of batch results and sharp breakthrough curves were obtained. This study indicated that the biomass of L. japonica can be used as an efficient biosorbent for the removal and recovery of cadmium(II) from waste water streams.

Keywords: Biosorption of Heavy Metals, Adsorption Desorption Kinetics, Cadmium Removal, Laminaria Japonica, Wastewater Treatment, Heavy-Metal Biosorption, *Rhizopus-arrhizus*, Marine-Algae, Interference, Recovery, Removal, Biosorbents, Uranium, Radiata, pH

Wu, F.C., Tseng, R.L. and Juang, R.S. (2001), Kinetics of color removal by adsorption from water using activated clay. *Environmental Technology*, **22** (6), 721-729.

Full Text: [E\Env Tec22, 721.pdf](E/Env%20Tec22,%20721.pdf)

Abstract: Kinetics and mechanism of adsorption of one commercial basic dye (BB69) and one direct dye (DR227) from aqueous solutions using clay were studied in the temperature range 15 similar to 75 degreesC. The clay was activated by treatment with sulfuric acid. Two simplified kinetic models, pseudo first-and second-order equations, were tested. it was shown that the adsorption of both dyes could be well described by the pseudo second-order equation Rate constants of the best-fit model were calculated, and the related apparent activation energies wee also evaluated and discussed.

Keywords: Kinetics and Mechanism, Color Removal, Adsorption, Activated Clay, Aqueous-Solutions, Fly-Ash, Textile Effluents, Equilibrium, Adsorbents, Sorption, Carbon, Cost, Dye, Sorbents

Prasad, B.B. and Pandey, U.C. (2001), Separation and preconcentration of lead from aquatic environment using *Microcystis*-based biosorbent. *Environmental Technology*, **22** (7), 771-780.

Full Text: [E\Env Tec22, 771.pdf](E/Env%20Tec22,%20771.pdf)

Abstract: The naturally abundant Microcystis surrounded by a slime layer has been immobilized as biofilm on a polymer-modified silica gel to obtain a lead-selective robust column packing material which is recyclable for 70 times without any distinct deterioration. The biosorbent has shown quantitative sorption with a preconcentration factor of 83 for trace level lead ion (initial concentration 0.48 µg ml(1)) in multielemental/natural water samples at pH 5.0 and flow rate 1.0 ml min(1).

Keywords: Algae, Microcystis, Biosorption, Column Chromatography, Differential Pulse Stripping Voltammetry, Metal, Chromatography, Cyanobacterium, Biosorption, Performance, Yeast, Slime, Layer

Choi, J.H., Shin, W.S., Lee, S.H., Joo, D.J., Lee, J.D. and Choi, S.J. (2001), Application of synthetic poly(DADM) flocculants for dye wastewater treatment. *Environmental Technology*, **22** (9), 1025-1033.

Full Text: [E\Env Tec22, 1025.pdf](E/Env%20Tec22,%201025.pdf)

Abstract: Poly(DADM) flocculants were synthesized and applied for the removal of color, turbidity and organic materials from dye wastewater. The effect of poly(DADM) on color removal was investigated by comparing two treatments: (i) alum alone and (II) alum/poly(DADM) in combination. The effects of poly(DADM) flocculant, poly(DADM) concentration, poly(DADM) types and pH on the removal efficiency of coloring materials were investigated. Poly(DADM) flocculants were highly efficient in the removal of color and turbidity from dye wastewater. Compared to treatment with alum alone, the addition of a small amount of poly(DADM) (25 mg l-1) reduced alum dosage by 50% while improving color removal efficiency. Highly efficient color removal was obtained in wide pH ranges by adding poly(DADM) as a flocculant. Our results indicate that the use of poly(DADM) flocculant is cost effective in dye wastewater treatment by reducing sludge production and the dosage of inorganic coagulant. Effects of zeta potential were also investigated.

Erdem, M., Altundogan, H.S., Özer, A. and Tümen, F. (2001), Cr(VI) reduction in aqueous solutions by using synthetic iron sulphide. *Environmental Technology*, **22** (10), 1213-1222.

Full Text: [E\Env Tec22, 1213.pdf](E/Env%20Tec22,%201213.pdf)

Abstract: This study was carried out to reduce Cr(VI) in aqueous solutions by using synthetic iron sulphide. For that purpose, the effects of acid content, contact time, initial Cr(VI) concentration, temperature of the solution, particle size and dosage of iron sulphide on the Cr(VI) reduction were investigated. Reduction extent of Cr(VI) is, to a great extent, dependent on the amount of acid. The Cr(VI) in the solution containing two times the H2SO4 with respect to stoichiometric amount of Cr(VI) was completely reduced within 45 min by using 2.5 g litre-1 iron sulphide at 25 degreesC. The reduction efficiency of Cr(VI) was increased with temperature of solution. The variation in particle size of iron sulphide did not affect the reduction yield of Cr(VI). The total reduction capacity of synthetic iron sulphide was found to be 237.6 mg Cr(Vl) g-1. The results related to shrinking particle model showed that the reduction reaction was chemically controlled and activation energy for the process was calculated as 38.4 kJ mol-1.

Keywords: Cr(VI) Reduction, Synthetic Iron Sulphide, Shrinking Particle Model, Kinetics, Removal

You, Y.W., Zhao, H.T. and Vance, G.F. (2001), Removal of arsenite from aqueous solutions by anionic clays. *Environmental Technology*, **22** (12), 1447-1457.

Full Text: [E\Env Tec22, 1447.pdf](E/Env%20Tec22,%201447.pdf)

Abstract: Layered double hydroxides are antitype 2/1 clay minerals that can be synthesized rapidly under laboratory conditions. Due to their high anion exchange capacities, layered double hydroxides have been investigated as potential adsorbents for removal of anionic contaminants from aqueous systems. In this study, uncalcined and calcined layered double hydroxides were prepared and characterized by X-ray diffraction, with the products evaluated for their ability to adsorb As(III) in aqueous solutions. Results indicated that As(III) could be adsorbed on chloride layered double hydroxide and calcined layered double hydroxide, but no adsorption occurred for carbonate layered double hydroxide. The adsorption isotherms of As(III) on chloride layered double hydroxide and calcined layered double hydroxide were typical L and H-type curves, respectively. The adsorption of As(III) on calcined layered double hydroxide was a slow process and reached a quasi-equilibrium after a 20 hr reaction time. The layered double hydroxides had high pH buffering capacities and the As(III) adsorption on calcined layered double hydroxide was a function of pH. Competing anions strongly affected adsorption, with As(III) adsorption increasing in the order: HPO42- < SO42- < CO32- < F- < Cl- < Br- ≈ I- < NO3-. Adsorbed As(III) on calcined layered double hydroxide could be desorbed by different anions, but there was no systematic relationship between As(III) desorption and anion affinities for the calcined layered double hydroxide. Calcination immobilized the As(III) adsorbed on calcined layered double hydroxides. Although layered double hydroxides could be recycled and used as an adsorbent, its adsorption efficiency was reduced with successive treatments.

Vieira, A.M.S., Bergamasco, R., Gimenes, M.L., Nakamura, C.V. and Dias Filho, B.P. (2001), Microbial populations of an upflow anaerobic sludge blanket reactor treating wastewater from a gelatin industry. *Environmental Technology*, **22** (12), 1477-1485.

Full Text: [E\Env Tec22, 1477.pdf](E/Env%20Tec22,%201477.pdf)

Abstract: The microbial populations of an upflow anaerobic sludge blanket reactor, used for treating wastewater from the gelatin industry, were studied by microbiological methods and phase-contrast and electron microscopy. Microscopy examination of the sludge showed a complex mixture of various rod-shaped and coccoid bacterial plus long filaments and very mobile curved rods. In addition free-living anaerobic ciliates and flagellates were also observed. The trophic group population observed in decreasing order of dominance were hydrolytic and acetogenic at 106 and sulfate reducing and methanogenic at 105. The rate of methane production in anaerobic granular sludge cultivated in growth medium supplement with formate pressurized with H2: CO2 showed a significant increase in methane yield compared with the seed culture containing the same substrate and atmosphere of N2: CO2. Similar rates of methane production were observed when the growth medium was supplemented with acetate pressurized either with H2: CO2 or N2: CO2. The number of total anaerobic bacteria at 107, fecal coliforms and total coliforms at 106, and fecal streptococci at 103 is based on colony counts on solid media. The four prevalent species of facultative anaerobic gram-negative bacteria that belong to the family of Enterobacteriaceae were identified as *Escherichia coli, Escherichia fergusonii, Klebsiella oxytoca*, and *Citrobacter freundii.* The species *Aeromonas hydrophila, Aeromonas veronii, Acinetobacter iwoffi* and *Stenotrophomonas maltophila* were the most frequently isolated glucose fermenting and nonfermenting gram-negative bacilli.

Basibuyuk, M., Yilmaz, T., Kayranli, B., Yuceer, A. and Forster, C.F. (2002), The use of waterworks sludge for the treatment of dye wastes. *Environmental Technology*, **23** (3), 345-351.

Full Text: [E\Env Tec23, 345.pdf](E/Env%20Tec23,%20345.pdf)

Abstract: Water treatment works using coagulation/flocculation in the process stream will generate a waste sludge. The works in Adana, Turkey uses ferric chloride. The potential for using this sludge for the treatment of reactive, direct, disperse, acidic, and basic dyestuffs by coagulation and sorption has been investigated. The sludge acted as a coagulant and removed colour with excellent removal efficiencies being obtained for basic, disperse and direct dyes. The optimum conditions were a pH value of 5 and a sludge dose of 2000 mg l-1. Mediocre results were obtained for acidic and reactive dyes. The efficiency of the sludge was also compared with alum and ferric chloride for the same group of dyes. The sludge was also used as a coagulant to treat the wastewater from a textile factory. At doses of 2000-4000 mg l-1, the sludge was as effective as ferric chloride and alum at removing COD. Sorption tests showed that the disperse and reactive dyes did not bind to the sludge. Langmuir and Freundlich constants were determined for the other three types of dye. Rate constants for the adsorption were determined using the Lagergren equation.

Keywords: Water Treatment, Waste Sludge, Dyestuff, Coagulation, Sorption, Color Removal, Effluent, Adsorption, Adsorbents

Delmas, C., Larpin, L., Legret, M. and Astruc, M. (2002), Mobility and adsorption capacity of Pb and Zn in a polluted soil from a road environment: Laboratory batch experiments. *Environmental Technology*, **23** (4), 381-390.

Full Text: [E\Env Tec23, 381.pdf](E/Env%20Tec23,%20381.pdf)

Abstract: A study of the mobility of lead and zinc in a contaminated soil from a road environment was conducted in order to evaluate the risk of groundwater contamination due to rainwater infiltration. The mobility of trace metals was evaluated using single chemical extractions and single-element sorption experiments. The distribution of trace metallic elements on the various soil fractions investigated with the use of sequential extractions, both before and after single extraction or sorption experiments, enabled the monitoring of changes in their localization. Metals are slightly extracted by sodium chloride solutions. High extraction yield was obtained for lead using EDTA. Lead was removed from the “acid-soluble”, “reducible” and “oxidizable” fractions, In contrast, zinc was less dissolved by means of complexation with EDTA, yet it showed very high sensitivity to variations in pH. Following single extractions, metals were redistributed in the “exchangeable” fraction. Sorption experiments evaluated the capacity of the soil to retain additional lead and zinc inputs. The results reveal that pH influences the sorption of these metals and the initial pollution present in the soil may induce desorption phenomena with respect to zinc. The high initial concentrations present in the soil do not seem to prevent the retention of additional metal in significant quantities. Added metals were located in the “exchangeable”, “add-soluble” and “reducible” fractions.

Keywords: Mobility, Lead, Zinc, Soil, Road, Sequential Extraction, Heavy-Metals, Trace-Metals, Speciation, Sediments, Redistribution, Sorption, Cadmium, Edta

Bouras, O., Chami, T., Houari, M., Khalaf, H., Bollinger, J.C. and Baudu, M. (2002), Removal of sulfacid brilliant pink from an aqueous stream by adsorption onto surfactant-modified Ti-pillared montmorillonite. *Environmental Technology*, **23** (4), 405-411.

Full Text: [E\Env Tec23, 405.pdf](E/Env%20Tec23,%20405.pdf)

Abstract: A modified hydrophobic and organophilic pillared clay (CTAC-TiH-montm) was prepared by exchanging some Ti polymeric cations into the interlamellar space of one Algerian montmorillonite (montm) and then by co-adsorption of some surfactant molecules such as cetyltrimethylammonium chloride (CTAC). These new materials were used in adsorption of an anionic textile dye: Sulfacid brilhant pink (SAP). According to adsorption isotherms, the organic modification of Ti-montmorillonite clay by CTAC surfactant increases the amount of textile dye fixed to more than 1000 mg g-1. The adsorption experiments showed that a ratio of 3 mmol of CTAC per g of clay and an acidic medium (pH = 4) were the optimal parameters necessary to obtain good adsorption uptake and colourless treated solutions. A comparative study proved the. high adsorption capacity of the synthesised adsorbents, they can thus be considered as powerful competitors to activated carbon in the treatment of aqueous textile plants and industry effluents.

Keywords: Acid, Activated Carbon, Adsorption, Adsorption Isotherms, Bentonite, Capacity, Carbon, Chloride, Clay, Dye, Dyes, Effluents, Industrial Wastewaters, Inorgano-Organo-Clays, Isotherms, Materials, Modification, Modified Clay, Montmorillonite, Organic, Parameters, pH, Pillared Clay, Plants, Polymeric, Priority Pollutants, Stream, Surfactant, Textile Dye, Ti-Pillared Montmorillonite, Treatment, Uptake

Varrault, G. and Bermond, A. (2002), Trace metal sorption ability of insolubilized humic acids. *Environmental Technology*, **23** (4), 421-428.

Full Text: [E\Env Tec23, 421.pdf](E/Env%20Tec23,%20421.pdf)

Abstract: The objective of this work was to study the trace metal sorption ability of Insolubilized Humic Acids (IHA) in comparison with regular Humic Acids (HA). IHA were prepared from HA by heating at 330°C for one hour under a nitrogen atmosphere. A solubility study was carried out at different pH values in NaNO3 (0.1 M) as a background electrolyte. It showed that IHA were insoluble until pH 10 whereas the solubility of HA increased with pH in one main step in the pH range 4-5 over which the soluble fraction of humic acids increased from 10% to 90%. We observed that trace metal sorption was dramatically influenced by these solubility properties. Indeed this study showed that above pH 5-6, HA and IHA may have opposite effects in terms of trace metal sorption. Solubilization of HA made possible the formation of soluble metal-humic complexes, retaining metal in solution even for pH at which hydroxide can form. Under such pH conditions, which very numerous soils show, HA could be involved in the transport and uptake of trace metals in the plant-soil system. In terms of remediation, HA are not a suitable binding phase. On the contrary IHA were not solubilized at neutral and alkaline pH, avoiding then the solubilization of sorbed trace metals. They appeared to be a suitable binding additive phase for future remediation trials.

Blais, J.F., Mercier, G. and Durand, A. (2002), Lead and zinc recovery by adsorption on peat moss during municipal incinerator used lime decontamination. *Environmental Technology*, **23** (5), 515-524.

Full Text: [E\Env Tec23, 515.pdf](E/Env%20Tec23,%20515.pdf)

Abstract: The objective of this research was to evaluate the efficiency of peat moss for lead and Zn recovery from alkaline leachates (pH 11.5) produced during decontamination of municipal incinerator fly ash. Tests carried out with peat moss columns (density of 0.13 g m l-1) gave very high removal yields for lead (98.9 to 100 %) and Zn (98.4 to 99.8 %). The initial metal concentrations in the leachates were 126 to 138 mg Pb l-1 and 14.4 to 23.5 mg Zn l-1. The columns were fed using two rates (20 and 40 ml min-1), which correspond respectively to 17.6 and 8.8 min as contact time on peat moss. Adsorption efficiencies of 16 to 18 mg Fb g-1 and 1.7 to 3.2 mg Zn g-1 have been measured during this fly ash leachate treatment study. The adsorbed toxic metals can be desorbed using a chlorhydric add solution. The peat moss can be regenerated and reused for several adsorption cycles without loss of the lead and Zn adsorption efficiencies.

Keywords: Lead, Adsorption, Fly Ash, Leaching, Peat, Fly-Ash, Waste

Milton, A. and Johnson, M.S. (2002), Food chain transfer of zinc within the ecosystems of old and modern metalliferous mine wastes. *Environmental Technology*, **23** (5), 525-536.

Full Text: [E\Env Tec23, 525.pdf](E/Env%20Tec23,%20525.pdf)

Abstract: Concentrations of zinc in mine waste, vegetation, invertebrate and small mammals from abandoned mines and a modern mine site have been determined in order to assess and compare environmental risk. Very high concentrations of zinc in mine waste from all sites were reflected in vegetation zinc levels but not in invertebrates and mammals. Physiological regulatory control mechanisms operate to optimise zinc retention, and maintain homeostasis in animals by enhancing absorption of zinc from diets low in the trace element, and by buffering the potential accumulative effects of high dietary levels of the metal. Zinc is not considered to be an acute toxicity factor precluding colonisation of these mine sites by invertebrates and mammals though it may be a selective force influencing the species composition and relative abundance in animal communities.

Keywords: Zinc, Ecotoxicology, Niine Tailings, Apodemus Sylvaticus, Wood Mouse, Contaminated Grassland Ecosystem, Mice Apodemus-Sylvaticus, Small Mammals, Cadmium, Copper, Metals, Soil, Invertebrates, Absorption, Pollution

Shen, Y.H. (2002), Removal of dissolved organic matter from water by adsorption-flocculation using organobentonite. *Environmental Technology*, **23** (5), 553-536.

Full Text: [E\Env Tec23, 553.pdf](E/Env%20Tec23,%20553.pdf)

Abstract: Bentonite modified with short chain cationic surfactant might be the basis of a new approach to removing dissolved organic matter (DOM) from water. The treatment process involves dispersing bentonite to the DOM-containing water and then adding a small cationic surfactant to result in flocs which are agglomerates of organobentonite and bound DOM. The flocs are then removed from the solution by sedimentation. Experimental results indicate that Benzyltrimethylammonium bromide (BTMA)-bentonite displays a high affinity for DOM, most likely due to aromatic groups in the DOM molecule interacting with the benzene ring in the BTMA ion through increased π-π type interactions. Under appropriate operating conditions, 75% DOM removal and nearly 100% bentonite recovery could be achieved by the adsorption-flocculation process using BTMA-bentonite. Additionally, the rapid adsorption kinetics made adsorption-flocculation with BTMA-bentonite attractive for continuous treatment of large volumes of raw water. The bentonite may function as a recyclable surfactant medium for the adsorption and subsequent combustion of organic pollutants.

Lin, S.H., Huang, C.U. and Cheng, M.J. (2002), Optimization of multistage phenol adsorption by organobentonites: Theoretical developments and experimental verification. *Environmental Technology*, **23** (6), 609-622.

Full Text: [E\Env Tec23, 609.pdf](E/Env%20Tec23,%20609.pdf)

Abstract: Material balance equations were developed for representing phenol adsorption by organobentonites in a countercurrent multistage adsorption process. The developed equations were employed to analyze the adsorption performance of the multistage process. Results of the theoretical analyses using empirical Freundlich adsorption isotherm had shown that the multistage process is more efficient than the single-stage process in terms of phenol removal per unit amount of organobentonite. It was also shown that equal division of the total amount of organobentonite among all adsorption stages yields the best overall phenol removal efficiency for the multistage process in comparison with other organobentonite allocations. The Freundlich adsorption isotherm was confirmed by experimental tests to describe well the phenol adsorption by organobentonites. Results of theoretical performance analyses of the multistage adsorption process were experimentally verified using two- and three-stage test examples.

Keywords: Multistage Crosscurrent Adsorption, Optimization Adsorbent Allocation, Organobentonites, Phenol Removal, Organo-Clays, Exchanged Clays, Sorption, Bentonite, Water, Contaminants, Pollutants, Cosorption

Mesquita, M.E., Carranca, C. and Menino, M.R. (2002), Influence of pH on copper - zinc competitive adsorption by a sandy soil. *Environmental Technology*, **23** (9), 1043-1050.

Full Text: [E\Env Tec23, 1403.pdf](E/Env%20Tec23,%201403.pdf)

Abstract: Copper and zinc adsorption and interaction were studied at different pH levels in a sandy soil (Gleyic Podzol) to understand heavy metal behaviour in soils with acidification hazards, polluted by the use of sewage sludge with high content of Cu and Zn. Soil samples were treated by solutions of Cu and Zn as nitrate salts with concentration levels up to 30 mg l-1 in a Ca(NO3)2 background. More Cu than Zn was adsorbed, mainly, specifically adsorbed. Copper and Zn in the exchange complex varied with soil solution pH. Adsorbed Cu and Zn increased with pH and as pH increased, more Cu than Zn was specifically adsorbed. Soil sorption of these cations was described by equilibrium isotherms that fitted either Freundlich or Langmuir type equations. The competitive Langmuir and extended Freundlich equations predicted for Cu and Zn values are in good agreement with the experimental data. Adsorption dependence on pH was more marked above pH 5 with a sharp increase of the distribution ratio D. Values for pH(50), offering a relative measure of the selectivity of the adsorbent for the metal cations, were higher for Zn than for Cu increasing with the amount of heavy metal added to the soil sample.

Keywords: Copper, Zinc, Langmuir and Freundlich Isotherms, Interaction, Kurbatov Plots, Freundlich Isotherms, Transport, Behavior, Solute, Zn

Iqbal, M. and Saeed, A. (2002), Removal of heavy metals from contaminated water by petiolar felt-sheath of palm. *Environmental Technology*, **23** (10), 1091-1098.

Full Text: [E\Env Tec23, 1091.pdf](E/Env%20Tec23,%201091.pdf)

Abstract: The ability of a reticulated fibrous network of palm petiolar felt-sheath (PPF) to remove toxic metals such as Cd, Cu and Zn from contaminated water was investigated as a new biosorbent system. PPF was found to sequester metal ions efficiently from dilute aqueous solutions with a selectivity order of Cd > Cu > Zn. The extent of adsorption was found to be dependent on pH, metal ion concentration and amount of biosorbent. The metal uptake was completed in a short time and contact of 30 min was observed to be optimum. The adsorption of all the three metals followed Langmuir isotherm. The bound metal ions were successfully desorbed and the PPF fibrous-biomass remained effective during five adsorption-desorption cycles. Present studies suggest that PPF has potential to be used in the removal/recovery of heavy metal ions from aqueous solutions.

Keywords: Biosorption, Petiolar Felt-Sheath, Heavy Metals, Palm, Agricultural By-Products, Toxic Metals, Waste-Water, Cadmium, Copper, Microalgae, Ions, Immobilization, Accumulation, Biosorption

Baup, S., Wolbert, D. and Laplanche, A. (2002), Importance of surface diffusivities in pesticide adsorption kinetics onto granular versus powdered activated carbon: Experimental determination and modeling. *Environmental Technology*, **23** (10), 1107-1117.

Full Text: [E\Env Tec23, 1107.pdf](E/Env%20Tec23,%201107.pdf)

Abstract: Three pesticides (atrazine, bromoxynil and diuron) and two granular activated carbons are involved in equilibrium and kinetic adsorption experiments. Equilibrium is represented by Freundlich isotherm law and kinetic is described by the Homogeneous Surface Diffusion Model, based on external mass transfer and intraparticle surface diffusion. Equilibrium and long-term experiments are conducted to compare Powdered Activated Carbon and Granular Activated Carbon. These first investigations show that crushing GAC into PAC improves the accessibility of the adsorption sites without increasing the number of these sites. In a second part, kinetics experiments are carried out using a Differential Column Batch Reactor. Thanks to this experimental device, the external mass transfer coefficient k(t) is calculated from empirical correlation and the effect of external mass transfer on adsorption is likely to be minimized. In order to obtain the intraparticle surface diffusion coefficient D-s for these pesticides, comparisons between experimental kinetic data and simulations are conducted and the best agreement leads to the D-s coefficient. This procedure appears to be an efficient way to acquire surface diffusion Coefficients for the adsorption of pesticides onto GAC. Finally it points out the role of surface diffusivity in the adsorption rate. As a matter of fact, even if the amount of the target-compound that could be potentially adsorbed is really important, its surface diffusion coefficient may be small, so that its adsorption may not have enough contact time to be totally achieved.

Keywords: Activated Carbon, Adsorption, Pesticides, Kinetic, Modeling, Diffusion Model, Batch Reactor, Adsorber, Acid, Beds, GAC

Marin, J. and Ayele, J. (2002), Removal of some heavy metal cations from aqueous solutions by spruce sawdust. I. Study of the binding mechanism through batch experiments. *Environmental Technology*, **23** (10), 1157-1171.

Full Text: [E\Env Tec23, 1157.pdf](E/Env%20Tec23,%201157.pdf)

Abstract: The biosorption of five metal ions, cadmium, copper, nickel, lead and zinc in single component solutions and a multicomponent mixture in aqueous solutions by spruce sawdust is reported. A comparative study, performed through batch experiments, between the cationic release of sawdust in ultra pure water and in a metallic solution leads to an understanding of the heavy metal ion fixation mechanism on sawdust. An empirical model is developed in order to distinguish between a sorption phenomenon purely based on ion exchange from one in which physical adsorption is involved. Thus, the difference in cations released between the two solutions corresponds to the metal ions which bind to anionic sites by displacing protons from acidic groups and existing cations (natural components of the sawdust) from anionic sites. Metal ion binding capacities of spruce sawdust reach values ranging from 2.1 to 4.3×10-2 meq g-1 in single metal ion solutions with the following relative preference: Zn < Ni < Cd much less than Cu < Pb. Our results show variable contributions of the different cations of the sawdust in the ion exchange mechanism in which calcium, naturally present in the sawdust, accounts for about 65% of the biosorption of the metal ions studied, The study also indicates the possibility of desorbing the loaded metal ions with a calcium solution.

Keywords: Spruce Sawdust, Heavy Metal Removal, Ion Exchange, Biosorption, Ion-Exchange, Biosorption, Peat, Moss, Biosorbents, Sorption, Wastes, Copper

Mustafa, S., Javid, M., Gul, R. and Murtaza, S. (2002), Sorption mechanism of Co2+ ions by AlPO4. *Environmental Technology*, **23** (10), 1173-1178.

Full Text: [E\Env Tec23, 1173.pdf](E/Env%20Tec23,%201173.pdf)

Abstract: Sorption studies were conducted for Co2+ ions on AlPO4 at different concentrations and temperatures. Sorption of Co2+ was found to increase with increase in concentration and temperature. To determine the mechanism of the sorption process, dissolution of AlPO4 in the presence of Co2+ ions and desorption studies were performed which indicated the mechanism of sorption to be the ion exchange followed by precipitation. FTIR studies were also employed to confirm the proposed mechanism.

Keywords: Sorption, Ion Exchange, Phosphates

Hernández, E. and Olguín, E.J. (2002), Biosorption of heavy metals influenced by the chemical composition of *Spirulina* sp. (*Arthrospira*) biomass. *Environmental Technology*, **23** (12), 1369-1377.

Full Text: [E\Env Tec23, 1369.pdf](E/Env%20Tec23,%201369.pdf)

Abstract: The capacity of *Spirulina* sp. cells with different chemical composition for Pb(II), Cd(II) and Cr(VI) sorption, was evaluated. Four different types of *Spirulina* biomass with a different chemical composition were tested. Two of them contained a high percentage of protein (68.95 ±0.30 and 63.73 ±0.25 %) as a result of being cultivated in Zarrouk medium and exposed at two light intensities (66 µmol photon m-2 s-1 and 144 µmol photon m-2s-1) in batch cultures. A third type of biomass, cultivated in a “Complex” medium and exposed at 66 µmol photon m-2 s-1, contained a high percentage of lipids (30.08 ±1.92 %). Finally, the fourth type of biomass was enriched in polysaccharides (25.54 ±0.51 %) as a result of being cultivated in the “Complex” medium, but exposed at 144 µmol photon m-2 s-1. It was found that the chemical composition of *Spirulina* sp. cells did have a strong influence on their adsorption capacity. The maximum adsorption capacities (qmax) for Pb and Cd were highest (172.41 and 54.05 mg g-1 of cells, at pH 5.0 and 4.5 respectively) when cells exhibited the higher polysaccharide content. In the case of Cr VI, the highest qmax was exhibited by cells cultivated in Zarrouk medium and showing the higher protein content (at pH 2.0). pH did not affect the adsorption of Pb II in the range of 3 to 5.5, nor of Cd in the range of 4 to 7. For Cr VI, adsorption was observed only at a pH equal to 2 or lower.

Karim, K. and Gupta, S.K. (2002), Biosorption of nitrophenols on anaerobic granular sludge. (*Arthrospira*) biomass. *Environmental Technology*, **23** (12), 1379-1384.

Full Text: [E\Env Tec23, 1379.pdf](E/Env%20Tec23,%201379.pdf)

Abstract: The sorption and desorption of 2-nitrophenol (2-NP), 4-nitrophenol (4-NP) and 2,4-dinitrophenol (2,4-DNP) on live anaerobic granular sludge was studied at five different sorbate (nitrophenols) concentrations between 10×103-90×103 μg 1-1. Experiments were conducted at room temperature (29±2degreesC) and at an initial pH of 73. The maximum uptake capacity of live anaerobic granular sludge was found to be 1427,1511 and 1865 μg g-1 VSS for 2-NP, 4-NP and 2,4-DNP, respectively. The equilibrium data of three nitrophenols obeyed both Freundlich and linear isotherm models. Sorption was observed to be partially reversible. About 20-89%, 36-90% and 29-80% desorption was observed for 10×103-90×10, μg 1-1 sorbate concentrations of 2-NP, 4-NP and 2A-DNP, respectively.

Keywords: Biosorption, Desorption, Freundlich Equation, Granular Sludge, Linear Isotherm, Nitrophenols, Hazardous Organic Pollutants, Biomass, Wastewaters, Reactors, Phenol, PCP

Balkaya, N. (2003), Variation of pH, conductivity and potential values in chromium (VI) removal by wool. *Environmental Technology*, **24** (1), 11-16.

Full Text: [E\Env Tec24, 11.pdf](E/Env%20Tec24,%2011.pdf)

Abstract: Variation of pH, conductivity and potential values in chromium(VI) removal by wool was investigated in this study. In addition to chromium(VI) concentrations, pH, conductivity and potential values were also traced during the experimental studies. After applying linear regression to experimental data, it was seen that there was a relationship between pH, conductivity, potential values and chromium(VI) concentrations in the aqueous solution after treatment with wool. This relationship was evaluated in the light of the analyses of the linear regression. Kinetic data and adsorption isotherms for chromium(VI) adsorption by wool were also determined.

de Matos, A.T., Brandão, V.S., Neves, J.C.L. and Martinez, M.A. (2003), Removal of Cu and Zn from swine raising wastewater using organic filters. *Environmental Technology*, **24** (2), 171-178.

Full Text: [E\Env Tec24, 171.pdf](E/Env%20Tec24,%20171.pdf)

Abstract: Rice husks, coffee bean skins, sugar cane bagasse, maize cobs, saw dust and fine charcoal dust were evaluated as filters for the removal of heavy metals (Cu and Zn) from the waste water of swine raising installations. The specific mass, pH and the sum of bases and removable acids were determined to characterize each of the filter materials. Each filtering material was placed in a 100 mm diameter, 600 mm long, PVC column to a height of 500 mm under 12, 500 N m-2 of compression. Chemical and physical analyses were determined on effluent samples collected for each 1.5 l up to a total of 15 l. The organic materials reduced the concentration of sediment solids (>90%), total solids (up to 33%) and Cu (up to 43.6%) of the inffluent but had little or no effect on Zn concentration.

Low, K.S., Lee, C.K. and Lee, T.S. (2003), Acid-activated spent bleaching earth as a sorbent for chromium(VI) in aqueous solution. *Environmental Technology*, **24** (2), 197-204.

Full Text: [E\Env Tec24, 197.pdf](E/Env%20Tec24,%20197.pdf)

Abstract: Spent bleaching earth, an industrial waste produced after the bleaching of crude palm oil, was investigated for its potential in removing Cr(VI) from aqueous solution. The earth was treated with different amounts of sulfuric acid and under different activation temperatures. Results show that the optimum treatment process involved 10% sulfuric acid at 350degrees C. The effects of contact time, pH, initial concentration, sorbent dosage, temperature, sorption isotherms and the presence of other anions on its sorption capacity were studied. Isotherm data could be fitted into a modified Langmuir isotherm model implying monolayer coverage of Cr(VI) on acid activated spent bleaching earth The maximum sorption capacity derived from the Langmuir isotherm was 21.2 mg-1. This value was compared with those of some other low cost sorbents. Studies of anion effect on the uptake of Cr(VI) on acid activated spent bleaching earth provided the following order of suppression: EDTA>PO43->SO42->NO3->Cl-.

Keywords: Spent Bleaching Earth, Sorption, Chromium(VI), Organic-Dyes, Palm Oil, Removal, Adsorption, Cr(VI), Shell

Blais, J.F., Shen, S., Meunier, N. and Tyagi, R.D. (2003), Comparison of natural adsorbents for metal removal from acidic effluent. *Environmental Technology*, **24** (2), 205-215.

Full Text: [E\Env Tec24, 205.pdf](E/Env%20Tec24,%20205.pdf)

Abstract: Adsorption tests were carried out in acidic synthetic solutions (PH 2.0) using 20 g l-1 of various natural adsorbents and 0.25 mM of 11 different metals. In decreasing order, the most efficient adsorbents tested were: oyster shells, cedar bark, vermiculite, cocoa shells and peanut shells. In contrast, weak metal adsorption was demonstrated by: red cedar wood, peat. wood, corn cobs and perlite. Metal adsorption capacities in acidic synthetic solution followed the order: Pb2+ > Cr3+ > Cu2+ > Fe2+ > Al3+ > Ni2+ > Cd2+ > Mn2+ > Zn2+ much greater thanCa2+, Mg2+. Alkaline treatment (0.75 M NaOH) increased the effectiveness of metal removal for the majority of adsorbents. In contrast, acid treatment (0.75 M H2SO4) either reduced or did not affect the adsorption capacity of the materials tested. Finally, oyster shells, red cedar wood, vermiculite, cocoa shells and peanut shells, were effective natural adsorbents for the selective recovery of lead and trivalent chromium from acidic effluent.

Keywords: Acid, Acid Treatment, Adsorbent, Adsorbents, Adsorption, Bark, Biosorption, Decontamination, Effluent, Electroplating Wastes, Fly-Ash, Heavy-Metals, Industrial-Wastes, Lead, Mechanisms, Metal, Metals, Modified Chitosan, Peat, pH, Products, Removal, Sorption, Wood

Reddad, Z., Gerente, C., Andres, Y. and Le Cloirec, P. (2003), Mechanisms of Cr(III) and Cr(VI) removal from aqueous solutions by sugar beet pulp. *Environmental Technology*, **24** (2), 257-264.

Full Text: [E\Env Tec24, 257.pdf](E/Env%20Tec24,%20257.pdf)

Abstract: The removal of three- and hexavalent chromium from aqueous solutions using sugar beet pulp as biosorbent substrate was performed. The kinetics of Cr(III) and Cr(VI) removal were studied at 20.0 ±0.5 °C and under various experimental conditions. The Cr(III) ions were adsorbed onto the biosorbent by ion-exchange mechanism with Ca2+ cations. The influence of solution pH was found to greatly affect the adsorption efficiency of Cr(VI). Cr(VI) removal was largely involved in a reduction mechanism with the appearance of Cr(III) ions in the solution.

? Yang, Q., Yang, M., Hei, L. and Zheng, S. (2003), Using ammonium-tolerant yeast isolates: *Candida halophila* and *Rhodotorula glutinis* to treat high strength fermentative wastewater. *Environmental Technology*, **24** (3), 383-390.

Full Text: [2003\Env Tec24, 383.pdf](2003/Env%20Tec24,%20383.pdf)

Abstract: Two ammonium-tolerant yeast strains were isolated from sludge samples contaminated with monosodium glutamate manufacturing wastewater and were identified as Candida haplophila and Rhodotorula glutinis. The tolerance of the two yeast isolates-to ammonia and their chemical oxygen demand (COD) removal performances were evaluated under batch and bench-scale conditions. The mixture of the two isolates was found to grow well in an artificial medium containing 25% (NH4)(2)SO4 and could effectively remove COD from monosodium glutamate wastewater even when the concentrations of NH4+-N and free NH3-N reached as high as 18977 and 879 mg 1(-1) respectively. A fixed-bed yeast reactor, which was initially inoculated with the yeast mixture, permitted a constant COD removal rate of over 80% during a period of near 2-month continuous running even when the influent COD was increased from 8000 to 25000 mg 1(-1). The effluent was accompanied with suspended solids (SS) of over 4500 mg 1(-1), which was mainly composed of yeast cells and could be considered as a source of animal forage additive. The residual COD of effluents from the yeast reactor could be further reduced to under 500 mg 1(-1) by a combination process of activated sludge treatment and coagulation technologies.

Keywords: Yeast, Monosodium Glutamate (MSG), Wastewater Treatment, Ammonium, Chemical Precipitation, Leachate

Li, Y.H., Wang, S., Zhang, X., Wei, J., Xu, C., Luan, Z., Wu, D. and Wei, B. (2003), Removal of some heavy metal cations from aqueous solutions by spruce sawdust. II. Adsorption-desorption through column experiments. *Environmental Technology*, **24** (3), 391-398.

Full Text: [E\Env Tec24, 391.pdf](E/Env%20Tec24,%20391.pdf)

Abstract: This paper describes a new adsorption material, carbon nanotube supported alumina, used for fluoride removal from water. The effects of calcination temperature, alumina loading and pH on fluoride removal capacity were investigated. The optimum calcination temperature for preparing the adsorbents is 450 degreesC and the largest adsorption capacity takes place at alumina loading of 30 wt%. The broad pH range of 6.0-9.0 with high adsorption capability suggests that carbon nanotube supported alumina have great potential applications in practice. The adsorption data at different pH were well fitted to the Freundlich isotherm. The kinetic studies show that the adsorption reaction of fluoride removal by carbon nanotube supported alumina can be described by a second order rate equation.

Keywords: Fluoride Removal, Adsorption, Carbon Nanotube Supported Alumina, Defluoridation, Adsorption

Marin, J. and Ayele, J. (2003), Removal of some heavy metal cations from aqueous solutions by spruce sawdust. II. Adsorption-desorption through column experiments. *Environmental Technology*, **24** (4), 491-502.

Full Text: [E\Env Tec24, 491.pdf](E/Env%20Tec24,%20491.pdf)

Abstract: The adsorption-desorption of copper ions and a mixture of five metal ions (cadmium, copper, nickel, lead and zinc) in aqueous solutions by a spruce sawdust column was reported. Different studies about the copper binding mechanism, the efficiency of some regenerating solutions for the copper desorption, the use of column for copper adsorption-desorption by successive cycles as well as the adsorption-desorption of a multi-component solution were investigated. An ion exchange mechanism seemed to explain the removal of copper by the natural components of sawdust, i.e., calcium, magnesium and manganese accounting for 71, 13 and 5.5% respectively of the copper binding on sawdust. But, there was evidence variation in the contribution of these ions during the copper adsorption in the continuous flow process. Regeneration of the sawdust column was described by the efficiency sequence: H+ > Ca2+ >> Na+, where protons were the most promising regenerating agents. Adsorption-desorption cycles showed that copper binding capacity of sawdust, after a decrease of 23% between cycles 1 and 2, was stabilized at 3.1×10-2 meq g-1 for the following cycles. Adsorption of a mixture of five metal ions indicated that nickel broke through first when saturation of sawdust was reached, followed by the other metal ions in the order: zinc, cadmium, copper and lead. The effects of competitive ion exchange, because of affinity differences between the metal ions for sawdust, resulting in the metals having the lower affinity being displaced by those having a higher one and to overshoot the 0.2 meq l-1 feed solution.

Keywords: Copper Removal, Sawdust, Affinity, Column, Ion Exchange, Biosorption, Sorption, Lead, Peat

Álvarez-Ayuso, E. and García-Sánchez, A. (2003), Removal of heavy metals from waste waters by vermiculites. *Environmental Technology*, **24** (5), 615-625.

Full Text: [E\Env Tec24, 615.pdf](E/Env%20Tec24,%20615.pdf)

Abstract: The sorbent behaviour of (natural and exfoliated) vermiculite minerals was studied with respect to metal cations (Ni, Cu, Cd) commonly present in waste waters of the metal finishing industry. The Langmuir model was found to describe the sorption processes well, showing the maximum sorption capacities of natural vermiculite to be high enough (bCu = 26.0 mg g-1, bCd = 23.5 mg g-1, bNi = 19.3 mg g-1) for its use in metal waste water purification systems to be feasible. The column studies performed with this mineral show that a large volume of metal solutions with similar concentrations to those usually present in waste waters can be purified down to the legal limit of waste. These positive results are ratified when real waste waters are used at lab-scale as well as at semi-industrial scale, validating the use of this mineral as a cost-effective treatment to purify such waste waters.

Balkaya, N. and Cesur, H. (2003), Influence of operating parameters on lead removal from wastewater by phosphogypsum. *Environmental Technology*, **24** (6), 727-733.

Full Text: [E\Env Tec24, 727.pdf](E/Env%20Tec24,%20727.pdf)

Abstract: The aim of this study was to investigate the influence of operating parameters on lead removal from wastewater by phosphogypsum. Batch adsorption studies were carried out to examine the effect of these parameters on lead removal from wastewater. The operating parameters investigated were adsorbent dosage, contact time, pH and initial lead concentration. Adsorption isotherms were modelled with the help of both Langmuir and Freundlich formulae. The kinetics of the adsorption process, which is important in the design of waste treatment systems, was also studied.

Keywords: By-Product, Phosphogypsum, Metal Removal, Wastewater, Adsorption Isotherm, Aqueous-Solutions, Heavy-Metals, Fly-Ash, Adsorbent, Sorption, Cr(VI), Adsorption, Kinetics, Lignin, Ni(II)

Naeem, A., Mustafa, S., Rehana, N., Dilara, B. and Murtaza, S. (2003), Selective removal of Pb2+ by AlPO4. *Environmental Technology*, **24** (6), 779-785.

Full Text: [E\Env Tec24, 779.pdf](E/Env%20Tec24,%20779.pdf)

Abstract: Aluminium(III) phosphate was observed to have a very high selectivity towards Pb2+ ions. Under similar conditions, the sorption capacities of the exchanger were observed to follow the order: Pb2+ > Zn2+ > Ni2+ > Co2+. The potentiometric titration data were used to determine the deprotonation constants (pKa) of AlPO4, which were dependent upon the temperature and nature of the metal cations present in the aqueous phase. Different physico-chemical methods *i.e*. FTIR, EPM and the wet chemical analyses were used to investigate the uptake mechanism of Pb2+ by the solid, which showed that no new solid phases were present in the solid residue after sorption of Pb2+ at pH 5. The exchange between protons from the surface and Pb2+ from solutions was found to be responsible for Pb2+ sorption by aluminum(III) phosphate.

Elizalde-González, M.P. and Peláez-Cid, A.A. (2003), Removal of textile dyes from aqueous solutions by adsorption on biodegradable wastes. *Environmental Technology*, **24** (7), 821-829.

Full Text: [E\Env Tec24, 821.pdf](E/Env%20Tec24,%20821.pdf)

Abstract: The adsorption of the textile dyes Basic Blue 41, Aniline Blue, Reactive Black 5 and Mariposa Blue was studied from model solutions prepared in distilled water in the concentration range up to 2000 mg l-1. Biodegradable wastes were used and are proposed here as adsorbents due to their abundance and inexpensiveness in the authors’ country. The influence of the particle size, pH, presence of an electrolyte in the dye solution, adsorbent activation and competition in ternary dyes mixtures was determined in this study. Adsorption capacity of the adsorbents designated as HOMAP and POMAP with particle diameter less than 3 mm for the Basic Blue 41 dye was found to be 164 and 77 mg g-1, respectively. The efficiency of the prepared adsorbents for removing basic, acid and reactive dyes with a concentration of 400 mg l-1 was examined. A comparison of the adsorption capacity and desorption feasibility of the adsorbents was made. The basic dye was adsorbed with efficiencies varying from 87 - 98%, the reactive dye was removed in the range 60 - 98% and the acid dye, 60 - 70% by three of the four adsorbents tested in this study. The determination of adsorption equilibrium concentrations was followed by HPLC with diode array detection.

Lin, S.H. and Wang, C.H. (2003), Adsorption and catalytic oxidation of phenol in a new ozone reactor. *Environmental Technology*, **24** (8), 1031-1039.

Full Text: [E\Env Tec24, 1031.pdf](E/Env%20Tec24,%201031.pdf)

Abstract: Phenolic wastewater treatment in a new ozone reactor was investigated. The reactor was designed in such a fashion that gas induction was created in the reactor headspace by the high-speed action of an impeller turbine inside a draft tube to maximize the ozone utilization. Another important feature of the present reactor design was incorporation of granular activated carbon bed in a circular compartment between the reactor wall and the shaft tube. The fixed granular activated carbon bed was observed to significantly enhance the phenol decomposition and the chemical oxygen demand removal when compared to gas-induced ozonation alone, providing evidence of the synergistic effects of adsorption, catalytic reaction and ozonation. In addition to the enhanced phenol decomposition and chemical oxygen demand, ozonation was found to provide in-situ regeneration of granular activated carbon which was considered crucial in the present reaction system. Kinetic investigations were also made using a proposed complex kinetic model in an attempt to elucidate the possible decomposition reaction mechanisms of the present gas-induced ozonation system.

Singh, I.B. and Singh, D.R. (2003), Effects of pH on Cr-Fe interaction during Cr(VI) removal by metallic iron. *Environmental Technology*, **24** (8), 1041-1047.

Full Text: [E\Env Tec24, 1041.pdf](E/Env%20Tec24,%201041.pdf)

Abstract: In the present investigation, the effect of pH on Cr-Fe interactions has been studied by carrying out Cr(VI) removal utilising metallic iron from the dichromate solutions of pH 2 to 7 by batch shaking process. Since the presence of ferrous iron in the solution is mainly responsible for Cr(VI) reduction, solubility of iron from the metallic iron was also measured. The maximum Cr(VI) removal efficiency was found at pH 2 but pH 3 was considered to be a suitable solution condition for Cr(VI) removal due to the occurrence of a minimum level of iron in the treated solution. Chemical analysis of Cr(VI)-reacted iron and treated dichromate solutions has indicated the reduction of Cr(VI) to Cr(III) at the metal surface itself at pH 2 and 3 and in the solution at pH 4 and above. A considerable decrease in chromium concentration on the iron surface in the pH range 4 - 7 as compared to pH 2 and 3 was also observed by EDXA analysis. These studies confirmed that after reduction, involvement of Cr(III) with Fe takes place at the metallic iron surface itself at pH 2 and 3 while it reduces with the rise of pH.

Jegadeesan, G., Mondal, K. and Lalvani, S.B. (2003), Comparative study of selenite adsorption on carbon based adsorbents and activated alumina. *Environmental Technology*, **24** (8), 1049-1059.

Full Text: [E\Env Tec24, 1049.pdf](E/Env%20Tec24,%201049.pdf)

Abstract: The sorption characteristics of carbon-based adsorbents such as activated carbon and chitin for the removal of selenite, Se (IV), an anionic, hazardous contaminant, are compared with those of alpha and gamma alumina. Batch experiments were conducted to determine the influence of pH, concentration of adsorbate, adsorbent loading and temperature on the sorption characteristics of the adsorbents. Generally, low pH of the solution resulted in favorable selenium removal. With the exception of activated carbon, uptakes decreased with increase in temperature. In comparison, chitin was found to be far less effective for the removal of Se (IV) from aqueous solutions. The data also showed that gamma alumina provided higher selenium removal percentages (99%) compared to a alumina (94%), activated carbon (87%) and chitin (49%). The selenite removal was found to decrease with increasing initial Se (IV) concentration in the solution. Adsorption capacities of the adsorbents are reported in terms of their Langmuir adsorption isotherms. The adsorption capacity (on unit mass basis) of the adsorbents for selenite is in the order: chitin (specific area (sa) = 9.58 m2g-1) < activated carbon (sa = 96.37 m2g-1) < alpha alumina (sa = 6 m2g-1) < gamma alumina (sa = 150 m2g-1).

Keywords: Adsorption, Selenite, Activated Carbon, Alumina, Langmuir Isotherm, Cross-Linked Chitosan, Hydrous Alumina, Water, Oxyanions, Kinetics, Removal

Hassen, A., Jamoussi, F., Saidi, N., Mabrouki, Z. and Fakhfakh, E. (2003), Microbial and copper adsorption by smectitic clay: An experimental study. *Environmental Technology*, **24** (9), 1117-1127.

Full Text: [E\Env Tec24, 1117.pdf](E/Env%20Tec24,%201117.pdf)

Abstract: The objective of this study was to quantify copper-, bacteria- and bacteriophage-binding capacities of natural clay with the aim of predicting the adsorption of heavy metals, human pathogenic bacteria and viruses by a clayey landfill liner. X-ray diffraction analysis of six natural clays showed that the dominant phase in all deposits consists of smectites together with illite, kaolin and, sometimes, palygorskite and sepiolite. The specific surface areas of different day substrates were very high ranging from 293 to 351 m2 g-1, and indicating a high proportion of phyllosilicates, consisting especially of smectites. The physico-chemical identification of separated smectites showed a high potential adsorbent character indicative of a large industrial use. The Kb 12 smectite substrate chosen arbitrarily among six separated substrates, appeared as an excellent copper adsorbent. Copper was adsorbed to clay in a proportion ranging from 94.6 to 96.0% with an average of 95.1% and its adsorption occurred rapidly in less than 30 min. Organic contents of the day substrate, evaluated as 17% of dry mass, may contribute and enhance copper adsorption. Different elution protocols using distilled water, 2 and/or 5% nitric acid revealed that while nitric acid resulted in the removal of more than 59% of the metal at the lower concentration and its complete depletion with a further elution at the higher concentration, distilled water alone was unable to remove more than 1% of adsorbed copper. This finding suggested that copper ions form high-energy bonds with layer-silicate surfaces. Interestingly, the use of a regenerated substrate as copper adsorbent subsequent to abundant washings of the used substrate consecutively, with 0.1N HNO3 and distilled water, reduced copper adsorption by approximately 14%, suggesting a slight disturbance of day initial structure. Batch adsorption experiments with phage T7 and raw clay Kb12 showed that e tested clay substrate appeared as a relatively moderate phage adsorbent since the quantity of adsorbed phage averaged 98.2±0.88% (2 log(10) retention) as measured by infectivity for Escherichia coli ATCC 11303. As shown by two types of separating procedures, natural sedimentation and a low speed centrifugation, bacteriophage particles were bound essentially to fine and not to relatively coarse particles of the day suspension. The retention capacity of purified day Kb12 appeared low, with average values lower than 60 and 50%, for Pseudomonas aeruginosa ATCC 15442 and Bacillus cereus ATCC 1135, respectively. A significant increase of retention, in the order of 30%, was found for both bacteria when the mixture clay-bacteria was incubated at laboratory temperature for 6 hours.

Keywords: Clay, Adsorption, Copper, Bacteria, Virus, Organic-Matter, Soil Clay, Sorption, Enteroviruses, Reovirus, Minerals, Iron, Zinc

? Liu, S.X., Hermanowicz, S.W. and Peng, M. (2003), Nitrate removal from drinking water through the use of encapsulated microorganisms in alginate beads. *Environmental Technology*, **24** (9), 1129-1134.

Full Text: [2003\Env Tec24, 1129.pdf](2003/Env%20Tec24,%201129.pdf)

Abstract: Biological treatment for removal of nitrate from drinking water is of great significance, as traditional physical and chemical methods could not effectively remove soluble nitrate. In this report immobilized microorganisms with co-immobilized calcium tartrate were used for reducing nitrate concentration (110 mg l-1 NO3-N) in a model solution. The carbon source also functions as a stabilizing agent for the immobilization matrix. Experiments of denitrification showed a high nitrate removal rate while nitrite residual was at a concentration higher than expected. The nitrate concentration was reduced to nearly zero (0.2-1.4 mg l-1) after 3 days of operation. The calcium tartrate (4%, w, w) co-immobilized alginate beads had better nitrate removal performance than tartrate in solution. The nitrite-N residual concentration was approximately 1.1-2.9 mg l-1 at the end of the experiments, showing the desirability of further denitrification. The stability of alginate beads was also tested both to evaluate their behaviors and investigate the efficacy of bead recycling. It was found that the beads could be used for 8-13 days consecutively without any structural deterioration and leaking of microbes.

Keywords: Biological Treatment, Drinking Water, Groundwater, Health, Immobilization, Immobilized-Cell Denitrification, Ion Chromatography, Microbial-Cells, Microorganisms, Nitrate Removal, Nitrification, Nitrite, Reaction-Kinetics, Sludge, Waste-Water, Water Quality

Tang, P.L., Lee, C.K., Low, K.S. and Zainal, Z. (2003), Sorption of Cr(VI) and Cu(II) in aqueous solution by ethylenediamine modified RCE hull. *Environmental Technology*, **24** (10), 1243-1251.

Full Text: [E\Env Tec24, 1243.pdf](E/Env%20Tec24,%201243.pdf)

Abstract: The sorption characteristics of Cr(VI) and Cu(II) by ethylenediamine modified rice hull from single and binary metal ion solutions were evaluated under various experimental conditions. Optimal Cr(VI) and Cu(II) removal from single metal ion solutions occurred at pH 2.0 and 5.5, respectively. Simultaneous removal of Cr(VI) and Cu(II) occurred at pH greater than 3.0. The sorption kinetics of Cr(VI) and Cu(II) from single and binary metal ion solutions were studied with reference to metal concentration, agitation rate and particle size. Sorption of Cr(VI) was more rapid than Cu(II). The kinetics of metal ion sorption fitted a pseudo-second order expression. The variation in the initial uptake rates was very small at an agitation rate beyond 150 rpm and sorption was generally independent of particle size. Equilibrium sorption data could be fitted into the Langmuir isotherm equation. Maximum sorption capacities of ethylenediamine modified rice hull for Cr(VI) at pH 2 and Cu(II) at pH 4 in single metal solutions were 0.45 and 0.06 mmol g-1, respectively. This corresponds to an enhancement factor of 2.6 and 3 fold for Cr(VI) and Cu(II), respectively, compared to natural rice hull. A synergistic effect was observed for sorption of these ions in binary metal solutions.

Keywords: Biomass, Biosorption, Cadmium, Chromate, Chromium, Concentration, Cr(VI), Heavy Metals, Ion, Isotherm, Kinetics, Langmuir Isotherm, Low-Cost Materials, Natural, Particle, Particle Size, pH, Removal, Rice, Rice Husk, Sorption, Sorption Kinetics, Uptake, Waste-Water, Wastewaters

Mustafa, S., Javid, M., Zaman, M.I., Gul, R. and Ali, H. (2003), The mechanisms of Ni2+ ions sorption by AlPO4. *Environmental Technology*, **24** (10), 1303-1313.

Full Text: [E\Env Tec24, 1303.pdf](E/Env%20Tec24,%201303.pdf)

Abstract: Sorption of Ni2+ ions by AlPO4 is studied as a function of concentrations and temperature at pH 7. Potentiometric titration, dissolution and FTIR studies are employed to determine the mechanism of the process of the uptake of Ni2+ ions which is found to be both the ion exchange and the surface precipitation of the corresponding metal phosphates. Freundlich equation is found applicable to the sorption data, and is employed to evaluate the thermodynamic parameters ΔH° and ΔS°.

Andrès, Y., Texier, A.C. and Le Cloirec, P. (2003), Rare earth elements removal by microbial biosorption: A review. *Environmental Technology*, **24** (11), 1367-1375.

Full Text: [E\Env Tec24, 1.pdf](E/Env%20Tec24,%201.pdf)

Abstract: This paper reviews published work on the sorption of rare earth elements by microbial biomass. In a first part, the biosorption capacities and the various experimental conditions performed in batch reactor experiments are compared. Secondly, sorption modelling generally used in biosorption studies are described. Thirdly, the microbial cell wall characteristics of the metallic ion binding sites are considered. From these observations it seems that the important functional groups for metallic ion fixation are the carboxyl and the phosphate moieties. Moreover, the competing effect of various ions like aluminium, iron, glutamate, sulphate etc. is described. Finally, some adsorption results of the rare earth elements in dynamic reactors are presented.

Keywords: Adsorption, Micro-Organisms, Mechanisms, Cation Competition, Rare Earth Elements, Rhizopus-arrhizus Biomass, Lanthanide La, Pseudomonas-Aeruginosa, Selective Biosorption, Yb Ions, Mycobacterium-Smegmatis, Metal Adsorption, Eu, pH, Gadolinium

Li, F. and Li, L.Y. (2003), An equation characterizing multi-heavy-metal sorption onto bentonite, forest soil and spruce bark. *Environmental Technology*, **24** (12), 1479-1490.

Full Text: [E\Env Tec24, 1479.pdf](E/Env%20Tec24,%201479.pdf)

Abstract: An empirical equation was developed to quantitatively describe heavy metal sorption in ternary systems of lead (Pb), copper (Cu) and cadmium (Cd). The three sorbants investigated were bentonite, forest soil and spruce bark. This multi-sorption equation is based on three assumptions: the relationship between sorption and initial heavy metal concentration fits a power curve, the presence of one heavy metal proportionately reduces the sorption curve of another heavy metal, and the competition between two heavy metals is independent of the presence of other heavy metals. The multi-sorption equation modeled sorption in ternary systems to a regression fit greater than 0.96. The data required for the equation were generated from a technically straightforward and quick laboratory program involving batch adsorption tests.

Keywords: Adsorption, Bark, Bentonite, Cadmium, Cd, Copper, Heavy Metal, Heavy Metals, Heavy-Metal, Lead, Pb, Sorption

Chaisuksant, Y. (2003), Biosorption of cadmium(II) and copper(II) by pretreated biomass of marine alga *Gracilaria fisheri*. *Environmental Technology*, **24** (12), 1501-1508.

Full Text: [E\Env Tec24, 1501.pdf](E/Env%20Tec24,%201501.pdf)

Abstract: The cadmium(II) and copper(II) adsorption properties of chemically pretreated biomass of red marine alga *Gracilaria fisheri* were investigated. Batch equilibrium experiments showed that the maximum adsorption capacity values of the pretreated biomass for cadmium and copper were 0.63 and 0.72 mmol g-1, respectively. The equilibrium data fitted well to the Langmuir isotherm model. The adsorption capacity increased as pH increased and readied a plateau at pH 4.0. The cadmium and copper uptake rates were rapid with 90% of the biosorption completed within 30 minutes. The presence of light metal ions (Na+, K+, Mg2+ and Ca2+) in solution had an insignificant effect on cadmium and copper sorption capacity. These findings indicate a positive potential for the biosorbent development with effective heavy metal removal capacity in the presence of light metal ions in waste streams by using the biomass of plentifully available red marine algae.

Keywords: Heavy Metal Biosorption, Red Marine Algae, Gracilaria Fisheri, Wastewater Treatment, Heavy-Metal Biosorption, Aqueous-Solutions, Durvillaea-Potatorum, Ecklonia-Radiata, Removal, Lead, Alginate, pH

Mustafa, S., Nawab, G., Naeem, A., Rehana, N. and Dilara, B. (2004), Temperature effect on phosphate sorption by iron hydroxide. *Environmental Technology*, **25** (1), 1-6.

Full Text: [E\Env Tec25, 1.pdf](E/Env%20Tec25,%201.pdf)

Abstract: The ion exchange sorption of phosphate on Fe(OH) 3 is studied as a function of temperature (25 - 55 degreesC) and concentration (1.49 - 3.23 mmol l-1). The mechanism of sorption is observed to be the exchange of OH- anions from the adsorbent surface by those of H2PO4- and HPO42- from the aqueous solution. An equation developed in the Langmuir formalism is used to explain the ion exchange sorption of phosphate on Fe(OH) 3. The isosteric heat of sorption illustrates that the uptake of phosphate on Fe(OH)3 takes place through an anion exchange process, involving both the phosphate anions HPO42- and HPO42- Further, at higher temperature the solid prefers the HPO42- anions forming a binuclear bridging complex.

Keywords: Sorption, Ion Exchange, Phosphate, Iron Hydroxide, Amberlite IRA-400, Adsorption, Chromate, Goethite, Exchange, Recovery

Jain, A.K., Suhas, Jain, S. and Bhatnagar, A. (2004), Removal of 2-fluoro and 2-iodophenol from aqueous solutions using industrial wastes. *Environmental Technology*, **25** (1), 15-22.

Full Text: [E\Env Tec25, 15.pdf](E/Env%20Tec25,%2015.pdf)

Abstract: A comparative study of the adsorbents prepared from several industrial wastes for the removal of 2-fluorophenol and 2-iodophenol has been carried out. The results show that maximum adsorption on carbonaceous adsorbent prepared from fertilizer industry waste has been found to be 35.3 and 235.3 mg g-1 for 2-fluorophenol and 2-iodophenol, respectively. Compared to carbonaceous adsorbent, the other three adsorbents (viz., blast furnace sludge, dust, and slag) adsorb phenols to a much smaller extent. This has been attributed to the carbonaceous adsorbent having a larger porosity and consequently higher surface area. The adsorption of phenols on this adsorbent has been studied as a function of contact time, concentration and temperature. The adsorption has been found to be endothermic, and the data conform to the Langmuir equation. The further analysis of data indicates that adsorption is a first order process and pore diffusion controlled. A comparative study of adsorption results with those obtained on standard activated charcoal sample shows that prepared adsorbent is about 45% as efficient as standard activated charcoal and therefore, can be fruitfully employed for the removal of phenolic pollutants from wastewaters.

Keywords: 2-Fluorophenol, 2-Iodophenol, Industrial Wastes, Adsorption Isotherms, Kinetics, Activated Carbon, Adsorption, Water, Adsorbent, Sorption, Kinetics, Phenol, Chlorophenols, Pollutants, Lead(II)

Inglezakis, V.J., Loizidou, M.D. and Grigoropoulou, H.P. (2004), Studies on the pretreatment of zeolite clinoptilolite in packed beds. *Environmental Technology*, **25** (2), 133-139.

Full Text: [E\Env Tec25, 133.pdf](E/Env%20Tec25,%20133.pdf)

Abstract: The effect of volumetric flow rate, ranging from 5 to 45 Bed Volumes per hour (BV h-1) and temperature, ranging from 25 to 59degreesC, during pretreatment of clinoptilolite on its effective capacity has been investigated. Pretreatment tests have been performed in an upflow ion exchange bed. Increased temperatures were found to increase the effective capacity of clinoptilolite. Effective capacity was maximal at low volumetric flow rates, indicating an influence of contact time and complete saturation of the zeolite bed at flow rates lower than 10 BV h-1. Furthermore, a comparison between upflow and downflow operation at the same operating conditions showed that better results are obtained in upflow conditions, probably due to the better wetting of the material and the absence of liquid maldistribution.

Keywords: Ammonia Removal, Cations, Clinoptilolite, Columns, Flow, Ion Exchange, Ion-Exchange, Liquid Holdup, Natural Clinoptilolite, Packed Bed, Pretreatment, Zeolites

Goel, J., Kadirvelu, K. and Rajagopal, C. (2004), Mercury(II) removal from water by coconut shell based activated carbon: Batch and column studies. *Environmental Technology*, **25** (2), 141-153.

Full Text: [E\Env Tec25, 141.pdf](E/Env%20Tec25,%20141.pdf)

Abstract: This study was undertaken to investigate adsorption behavior of Hg(II) from aqueous systems on activated carbon in static and dynamic mode by varying initial Hg(II) concentration, adsorbent dose and pH. Langmuir and Freundlich adsorption isotherm were applied to model the adsorption data. Removal of mercury obeyed the Langmuir and Freundlich adsorption isotherm models. The extent of removal of Hg(II) was found to be dependent on sorbent dose, pH and initial Hg(II) concentration. Mercury uptake increased from 72 to 100 percent with increasing pH from 2 to 10. A set of desorption studies was also performed for the metal ions with the aim of investigating the mechanism involved. Moreover, the competing effects of various ions like Pb(II) and Cu(II) is also described. The column capacity for a column diameter of 20 mm, bed height of 0.4 m, hydraulic loading rate of 7.5 m3h-1m-2 and a feed concentration of 3 mg l-1 were found to be 3.02 mg g-1. Breakthrough curves were plotted for the adsorption of mercury on the adsorbent using continuous-flow column operation by varying different operating parameters like hydraulic loading rate (3-10.5 m-3h-1m-2), bed height (0.3-0.5 m), and feed concentrations (2-6 mg l-1). The aim was to assess the effect of bed height, hydraulic loading rate and initial feed concentration on breakthrough time and adsorption capacity, which helped in ascertaining the practical applicability of the adsorbent. At the end an attempt has been made to develop empirical relationship from the data generated from column studies for designing the adsorption column, based on the Bohart-Adams model.

Shin, E.W., Han, J.S. and Min, S.H. (2004), Removal of phosphorus from water using lignocellulosic material modified with iron species from acid mine drainage. *Environmental Technology*, **25** (2), 185-191.

Full Text: [E\Env Tec25, 185.pdf](E/Env%20Tec25,%20185.pdf)

Abstract: Lignocellulosic biosorbents, including juniper fiber, show promise as sorbents for removing pollutants from wastewater runoff because of their low cost. In this study, juniper fiber modified with iron species from acid mine drainage (AMD) was tested for its capacity to remove phosphorus from water compared to unmodified juniper fiber. In batch tests, the maximum adsorbate loading (Qmax) of phosphorus onto the modified adsorbent was 1.83 mg g-1 at pH 4.0, obtained by fitting the isotherm results to the Langmuir isotherm model. This value is similar to the sorption capacity of other conventional adsorbents such as goethite, which implies that the modified lignocellulosic material would be effective as a sorbent for removing phosphorus from water. In the kinetic test, the pseudo-second order kinetic model fitted well the sorption of phosphorus onto the modified filter medium, showing the kinetic constant (k) of 8.09×10-2 g(mg min)-2 at initial phosphorus concentration of 10 mg l-1.

Keywords: Lignocellulosic Material, Acid Mine Drainage, Iron Species, Phosphorus Removal, Waste-Water, Metal-Ions, Adsorption, Phosphate, Kinetics, Equilibrium, Exchangers, Sorbent

Gerente, C., Reddad, Z., Andres, Y. and Le Cloirec, P. (2004), Competitive adsorption of metals and organics onto a low cost natural polysaccharide. *Environmental Technology*, **25** (2), 219-225.

Full Text: [E\Env Tec25, 219.pdf](E/Env%20Tec25,%20219.pdf)

Abstract: Metals removal onto a low-cost natural polysaccharide is performed. Firstly, some specific characteristics of adsorbent are determined. Potentiometric titrations of the sorbent have been realised. The values of the point of zero net proton charge (pznpc) and the cation exchange capacity (CEC) deduced from these experiments have given respectively pH = 5 and 0.575 meq g-1. Secondly, sorption of cations from single metallic solution, have been performed and the equilibrium fixation capacities are 0.37 mmol g-1 for Pb2+, 0.28 mmol g-1 for Cu2+ and 0.2 mmol g-1 for Ni2+. In multi-metals solutions of equimolar concentration, Ni2+ ions present the greatest fixation decrease in the presence of the two other cations (-61%), Pb2+ and Cu2+ seem to compete similarly. In the presence of a constant organic load composed of either benzaldehyde, benzoic acid or phenol and expressed as 100 mg l-1 total organic carbon (TOC), benzoic acid induces the largest reduction of the copper equilibrium fixation capacity (-30%).

Kundu, S., Pal, A., Ghosh, S.K., Mandal, M. and Pal, T. (2004), Removal of arsenic from water using hardened paste of portland cement. *Environmental Technology*, **25** (3), 301-309.

Full Text: [E\Env Tec25, 301.pdf](E/Env%20Tec25,%20301.pdf)

Abstract: Portland cement has been used as a new low-cost adsorbent for the removal of arsenic from the water environment. In the batch experiments conducted at an initial concentration of 0.2 mg l-1 of arsenate, it was found that up to 95% of arsenate could be removed. Kinetic profiles were developed for various conditions. The effect of adsorbent dose, effects of common ions such as Ca2+, Mg2+, Fe3+/Fe2+, Cl-, SO42-, NO3-, PO43- and the effect of pH was studied. Adsorption isotherm studies were performed and it was observed that the Freundlich isotherm was followed with a better correlation than the Langmuir isotherm. Arsenite could also be removed up to ~88% using the same material. A new detection method for arsenate/arsenite was developed for routine analysis of arsenic and used during the entire study.

Ersoy, B. and Çelik, M.S. (2004), Uptake of aniline and nitrobenzene from aqueous solution by organo-zeolite. *Environmental Technology*, **25** (3), 341-348.

Full Text: [E\Env Tec25, 341.pdf](E/Env%20Tec25,%20341.pdf)

Abstract: Adsorption mechanisms of toxic non-ionic organic contaminants (NOCs), aniline and nitrobenzene, with natural-zeolite and organo-zeolite (OZ) were investigated in both batch and continuous systems. In batch tests, the adsorption capacity of aniline and nitrobenzene onto natural zeolite surface is very low or almost nil but becomes significant upon modifying the zeolite surface by hexadecyltrimethylammonium (HDTMA). A partitioning mechanism is proposed to be responsible for the adsorption of NOCs onto OZ. The effectiveness of the partitioning mechanism is directly connected with hydrophobic properties of the NOCs. The column tests were carried out as an indicator for continuous system. The breakthrough curves were constructed for OZ/NOC system and the adsorption capacity of NOCs onto OZ under the present conditions were determined as 2.36 and 3.25 mg per gram of OZ, for aniline and nitrobenzene, respectively. A schematic model is proposed to account for the adsorption of NOCs onto OZ.

Keywords: Organo-Zeolite, Organic Contaminant, Partitioning Mechanism, Sorption, Clinoptilolite, Surfactant-Modified Zeolite, Modified Clinoptilolite, Natural Clinoptilolite, Cationic Surfactant, Heavy-Metals, Sorption, Water, Contaminants, Removal, Chromate

Özer, A. and Özer, D. (2004), The Adsorption of Cr(VI) on sulphuric acid-treated wheat bran. *Environmental Technology*, **25** (3), 689-697.

Full Text: [E\Env Tec25, 689.pdf](E/Env%20Tec25,%20689.pdf)

Abstract: Wheat bran, a by-product of wheat milling industries, was converted into a cheap and efficient material by treating with sulphuric acid and used for the adsorption of Cr(VI) from aqueous solution. Effects of various parameters such as initial pH of solution, contact time, initial Cr(VI) concentration and temperature were studied. The sulphuric acid-treated wheat bran (STWB) gave the highest adsorption efficiency at pH 1.5. The equilibrium data were fitted better to Langmuir isotherm model compared to Freundlich model at all the temperatures studied. The adsorption capacity increased from 91 to 133 mg g-1 with an increase in temperature from 20 °C to 50 °C. The adsorption process was found to be endothermic and Langmuir isotherm data were evaluated to determine the thermodynamic parameters for the process. Thermodynamic parameters showed that the process was feasible. The results indicated that the chromium removal process by STWB followed first-order rate expression and adsorption rate constants increased with increasing temperature.

Fang, H.H.P. and Zheng, H.H. (2004), Adsorption of phthalates by activated sludge and its biopolymers. *Environmental Technology*, **25** (7), 757-761.

Full Text: [E\Env Tec25, 757.pdf](E/Env%20Tec25,%20757.pdf)

Abstract: This study shows diethyl phthalate (DEP) and dibutyl phthalate (DBP) were substantially adsorbed by activated sludge and its extracellular polymeric substance (EPS). The adsorption characteristics followed Freundlich and Langmuir isotherms. According to the Langmuir isotherm, each gram of activated sludge at maximum adsorbed 0.73 mg of DEP and 17.6 mg of DBP, and each gram of centrifugation-extracted EPS adsorbed 14.3 mg of DEP and 10.6 mg of DBP. The adsorption increased with the hydrophobicity of phthalates. This suggests most phthalates, which are of higher hydrophobicity than DEP and DBP, are likely to be removed from wastewater through adsorption by the activated sludge in the biological treatment process.

Baudu, M., Raveau, D. and Guibaud, G. (2004), Application of the IAS theory combining to a three compartiments description of natural organic matter to the adsorption of atrazine or diuron on activated carbon. *Environmental Technology*, **25** (7), 763-773.

Full Text: [E\Env Tec25, 763.pdf](E/Env%20Tec25,%20763.pdf)

Abstract: The study of natural organic matter (NOM) adsorption on an activated carbon showed that equilibrium cannot be described according to a simple model such as a Freundlich isotherm and confirms the need for a closer description of the organic matter to simulate the competitive adsorption with micropollutants. A representation of the organic matter in three fractions is chosen: non-adsorbable, weak and strong adsorbable. The Ideal Adsorbed Solution Theory (IAST) can, under restrictive conditions, be used to effectively predict the competition between the pesticides and the organic matter. Therefore, it was noted that the model simulated with good precision the competition between atrazine or diuron and natural organic matter in aqueous solution for two activated carbons (A and B). The same parameters for the modeling of organic matter adsorption (Freudlich constants for two absorbable fractions) are used with the two pesticides. However, LAST does not allow correct modeling of pesticide adsorption onto two other (C and D) activated carbons in solution in natural water to be described. IAS theory does not reveal competition between diuron and NOM and pore blockage mechanism by the NOM is proposed as the major effect for the adsorption capacity reduction. However, the difference observed between the two pesticides could be due to in addition to the pore blockage effect, a particular phenomenon with the diuron, especially with D activated carbon. We can suppose specific interactions between the diuron and the adsorbed organic matter and a competition between adsorption sites of NOM and activated carbon surface.

Keywords: Activated Carbon, Competitive Adsorption, Iast, Natural Organic Matter, Atrazine, Diuron, Micropore Size Distribution, Competitive Adsorption, Prediction, Water, Equilibria, Isotherms, Sorption, Micropollutants, Thermodynamics, Heterogeneity

Vujevic, D., Koprivanac, N., Loncaric Bozic, A. and Locke, B.R. (2004), The removal of Direct Orange 39 by pulsed corona discharge from model wastewater. *Environmental Technology*, **25** (7), 791-800.

Full Text: [E\Env Tec25, 791.pdf](E/Env%20Tec25,%20791.pdf)

Abstract: Untreated wastewater from the dye industry and dyehouses cannot be directly discharged into the environment due to the high content of organic matter and intensive colouration, even with low concentrations of dye. In this paper, the application of a high voltage pulsed electrical discharge in the aqueous phase has been assessed for the dye degradation. Experiments were conducted in a batch reactor using model wastewater of the commercial water-soluble monoazo dye C.I. Direct Orange 39 (DO39). The effects of zeolite and ferrous sulphate in combination with the corona discharge were examined. Experiments were conducted for a range of process parameters including pH, conductivity, type and amount of zeolite, and ferrous sulphate concentration. A mathematical model to describe the kinetics of DO39 degradation in the corona reactor was developed. Aqueous phase pulsed streamer corona discharge as a method for coloured wastewater treatment showed very high effectiveness in the case of iron salt addition (Fenton’s reaction). Low pH enhanced dye removal by corona in the absence of zeolite, thus implying that the acid properties of zeolites are important in dye degradation. Ecological parameters such as COD, TC, IC, TOC and IC50 measured before and after corona treatment showed that the treated wastewater can be discharged into the environment or reused as process water.

Solache-Ríos, M., Olguín, M.T., García-Sosa, I. and Jiménez-Becerril, J. (2004), Evaluation of the sorption properties of a Mexican Organo clinoptilolite-rich tuff for phenol and 4-chlorophenol. *Environmental Technology*, **25** (7), 819-824.

Full Text: [E\Env Tec25, 819.pdf](E/Env%20Tec25,%20819.pdf)

Abstract: A Mexican clinoptilolite-rich tuff was modified with the hexadecyltrimethyl ammonium (HDTMA) and used for the sorption of phenol and 4-chlorophenol. Whereas the zeolitic tuff had no affinity for phenol and 4-chlorophenol, the modified zeolite removed these organic compounds. The sorption behavior from aqueous solutions was studied by means of batch type and column experiments and isotherms were determined. It was found that the uptake was higher for 4-chlorophenol than for phenol.

Fávere, V.T., Laus, R., Laranjeira, M.C.M., Martins, A.O. and Pedrosa, R.C. (2004), Use of chitosan microspheres as remedial material for acidity and iron(III) contents of coal mining wastewaters. *Environmental Technology*, **25** (8), 861-866.

Full Text: [E\Env Tec25, 861.pdf](E/Env%20Tec25,%20861.pdf)

Abstract: Chitosan microspheres are highly effective in neutralizing the acidity of wastewaters from coal mining. The saturation capacity for the formation of a superficial monolayer on the adsorbent was interpreted using Langmuir isotherm and considering the amino groups as the adsorption sites for hydronium ions. The saturation capacity of the surface of the static system was 0.428 mol kg-1, higher than that of the dynamic one. This value corresponds to the neutralization of 135 liters of wastewater per kilogram of microspheres. One gram of chitosan microspheres was capable of increasing wastewater pH from 2.5 to 4.0 and removing approximately 100% of its iron(III) contents.

Keywords: Adsorption, Adsorption, Beads, Chitosan, Coal Mining, Dyes, Heavy-Metals, Ions, Microspheres, Mine Drainage, Removal, Wastewaters, Water

Bishnoi, N.R., Bajaj, M. and Sharma, N. (2004), Adsorption of Cr(VI) from aqueous and electroplating wastewater. *Environmental Technology*, **25** (8), 899-905.

Full Text: [E\Env Tec25, 899.pdf](E/Env%20Tec25,%20899.pdf)

Abstract: The aim of this work was to investigate the use of activated rice husk carbon prepared by thermal activation and activated alumina in the removal of Cr(VI) from aqueous solution and electroplating wastewater through column studies. The optimum solution pH was found to be 2 for activated rice husk carbon and 4 for activated alumina in the batch process. This was further applied to the aqueous solution to optimise the column bed height, diameter and flow rate of solute. These optimised conditions were applied to the electroplating wastewater. It was observed that activated rice husk is an efficient adsorbent and comparable to commercially available activated alumina. The percent Cr(VI) removal from wastewater was 73.3% with activated rice husk and 75.3% with activated alumina after 1 h continuous flow at the rate of 5 ml min-1 from 7.5 cm bed height of adsorbent in a column having diameter 2.5 cm. A long contact time of the samples with adsorbents resulted in desorption of Cr(VI) from the adsorbent surfaces. However, the adsorption rate increased with the more available adsorbent surface sites when column bed height and diameter were greater. There was a decrease in Cr(VI) removal compared to aqueous sample due to the presence of other metal ions in the wastewater sample.

Barrera-Díaz, C., Colín-Cruz, A., Ureña-Nuñez, F., Romero-Romo, M. and Palomar-Pardavé, M. (2004), Cr(VI) removal from wastewater using low cost sorbent materials: Roots of *Typha Latifolia* and ashes. *Environmental Technology*, **25** (8), 907-917.

Full Text: [E\Env Tec25, 907.pdf](E/Env%20Tec25,%20907.pdf)

Abstract: This work presents conditions for hexavalent chromium (Cr(VI)) removal from aqueous solution using different sorbent materials, namely: pyrolytic ashes of an industrial sludge from wastewater treatment and roots of *Typha latifolia*. The sorbent materials were characterized using scanning electron microscopy (SEM) and surface area using theBrunauer-Emmett-Teller (BET) technique, before and after the contact with the chromium-containing aqueous media. An overall Cr(VI) concentration reduction of 45 % was achieved using the roots of *Typha latifolia* whereas in the case of pyrolytic ashes a 60 % removal was observed. The percentage removal was found to depend on the initial Cr(VI) concentration in aqueous solution, pH and temperature. The Cr(VI) uptake process was maximum at pH 2 and a temperature of 40 °C for both sorbents. These materials showed a Cr(VI) adsorption capacity that was adequately described by the Langmuir adsorption isotherm. It was demonstrated that the use of waste materials for the treatment of Cr(VI)-containing wastewater is an effective and economical alternative method.

Sepúlveda, L., Fernández, K., Contreras, E. and Palma, C. (2004), Adsorption of dyes using peat: Equilibrium and kinetic studies. *Environmental Technology*, **25** (9), 987-996.

Full Text: [E\Env Tec25, 987.pdf](E/Env%20Tec25,%20987.pdf)

Abstract: In recent years, adsorption has been accepted as one of the most appropriate processes for decolorization of wastewaters. This paper presents experimental results on application of peat for removal of structurally diverse dyes (azo, oxazine, triphenylmethane, thiazine and others) with emphasis on relevant factors such as the adsorbate-adsorbent chemical properties and chemical interaction as well as adsorption conditions. The equilibrium experimental results were fitted to Langmuir and Freundlich isotherms to obtain the characteristic parameters of each model. According to the evaluation using the Langmuir equation, the maximum sorption capacity of basic dyes at 22°C was 667 (mg g-1) for Basic Blue 24, 526 (mg g-1) for Basic Green 4 and 714 (mg g-1) for Basic Violet 4. On the other hand for Acid Black 1 it was only 25 (mg g-1). Batch kinetics studies were undertaken and the data evaluated in compliance with chemical sorption mechanisms. For all of the systems studied the pseudo-second order model provided the best correlation of the kinetic experimental data. A film-pore double resistance diffusion model for mass transfer has also been used in this study to determine the effective diffusivity, Deff, for the adsorption of basic dyes in to peat.

Al-Haj-Ali, A. and Al-Hunaidi, T. (2004), Breakthrough curves and column design parameters for sorption of lead ions by natural zeolite. *Environmental Technology*, **25** (9), 1009-1019.

Full Text: [E\Env Tec25, 1009.pdf](E/Env%20Tec25,%201009.pdf)

Abstract: Sorption of lead ions, by natural phillipsite (zeolite) has been studied in a laboratory-scale packed-bed column. Breakthrough curves were obtained under different operating conditions. Bed depth- service time (BDST) model was applied and parameters for column design were determined for lead ions at 5% breakthrough yielding BDST sorption capacity of 24.27- 35.73 mg g-1, rate constant 2.80×10-4 - 4.16×10-4 dm3mg-1.min-1, critical bed depth 4.02-10.37cm and sorbent exhaustion rate of 12-51.3 g zeolite per dm(3) of treated solution over a flow-rate range of 14.15-36.80 cm.min-1. Breakthrough times at C, C-o = 0.05 ranged from 5-100 min depending on flow rate and bed depth. External mass transfer is rate limiting in the initial stages of adsorption as indicated by agreement between Wolborska model and the experimental data in the low C, C-o region of the breakthrough curve.

Keywords: Adsorption, Ammonia Removal, Australian Zeolite, Bdst Model, Copper, Exchange, Fixed-Bed Column, Granular Activated Carbon, Kinetics, Lead, Metals, Sorption, Waste-Water, Zeolite, Zinc

Mahramanlioglu, M. and Güçlü, K. (2004), Equilibrium, kinetic and mass transfer studies and column operations for the removal of arsenic(III) from aqueous solutions using acid treated spent bleaching earth. *Environmental Technology*, **25** (9), 1067-1076.

Full Text: [E\Env Tec25, 1067.pdf](E/Env%20Tec25,%201067.pdf)

Abstract: In the present study, a new adsorbent was produced from spent bleaching earth by H2SO4 impregnation method. The sorption of arsenic(III) by acid treated spent bleaching earth was studied to examine the possibility of utilizing this material in water treatment systems. The effect of time, pH, initial concentration, temperature on the adsorption of arsenic(III) was studied. Maximum adsorption was found to occur at pH 9.0. The adsorption process followed the first order Lagergren equation. Mass transfer coefficients and rate constants of intraparticle diffusion were calculated. The experimental data points were fitted to the Langmuir equation in order to calculate the adsorption capacity (Q0) of the adsorbent and the value of Q0 was found to be 0.46 mmol g-1. In order to understand the adsorption mechanism, Dubinin-Radushkevich (DR) isotherm was used. The magnitude of E calculated from DR equation was found to be 5.12 kJ mol-1. The heat of adsorption (ΔH0 = -30367 J mol-1) implied that the adsorption was physical exothermic adsorption. The column studies were also carried out to simulate water treatment processes. The capacity values obtained in column studies were found to be greater than the capacity values obtained in batch studies. This result was explained by the difference between batch system and column system. The factors that affect the capacity values of column and batch systems were explained. The effect of other anions on the adsorption of arsenic(III) in the presence of NO3-, SO42-, Cl-, Br- was studied. The presence of these anions did not affect the adsorption of arsenic(III) significiantly.

Prasher, S.O., Beaugeard, M., Hawari, J., Bera, P., Patel, and R.M. Kim, S.H. (2004), Biosorption of heavy metals by red algae (*Palmaria palmata*). *Environmental Technology*, **25** (10), 1097-1106.

Full Text: [E\Env Tec25, 1097.pdf](E/Env%20Tec25,%201097.pdf)

Abstract: The biosorption of heavy metals from aqueous solutions was investigated, using a cheap and abundant dry biomass of red algae *P. palmata*. The Freundlich, Langmuir and Brunauer Emmer and Teller (BET) models were used to describe the uptake of lead (Pb2+), copper (Cu2+), nickel (Ni2+), cadmium (Cd2+) and zinc (Zn2+) on *P. palmata*. The good fits of the Langmuir and BET models to the experimental data reflected that the sorption on *P. palmata* was a multi-layer sorption*,* in which a Langmuir equation could be applied to each layer. The highest maximum sorption capacity qmax, derived from the Langmuir model was 15.17 mg g-1 for lead and 6.65 mg g-1 for copper (dry weight metal/dry weight biosorbent) at a pH of 5.5-6. The affinity of metals for *P. palmata* was found to decrease in the order: Pb2+ > Cd2+ > Cu2+ > Ni2+. The factors influencing copper and lead uptake were found to be contact time, pH, initial concentration and temperature. Biosorption of copper and lead was a rapid process, with 70% and 100% of the respective uptakes occurring within the first 10 minutes.

Keywords: Biosorption, Heavy Metals, Red Algae, *P. Palmata*

Li, J.G., Lalman, J.A. and Biswas, N. (2004), Biodegradation of Red B dye by *Bacillus sp. OY1-2*. *Environmental Technology*, **25** (10), 1167-1176.

Full Text: [E\Env Tec25, 1167.pdf](E/Env%20Tec25,%201167.pdf)

Abstract: Batch tests were employed to investigate the effects of aerobic and anoxic conditions on the biodegradation of Red B dye by *Bacillus OY1-2*. Results from batch experiments demonstrated anoxic conditions were beneficial for rapid biodegradation of Red B dye in comparison to aerobic conditions. Biodegradation is a major mechanism in the decolorization of Red B dye in comparison with biosorption, which accounted for only 8% of the total decolorization efficiency. Reactors packed with granular activated carbon (GAC) and inoculated with *Bacillus OY1-2* were investigated to treat a synthetic wastewater under anoxic conditions. In the absence of cosubstrates, Red B dye was degraded, however, a significant improvement in degradation resulted with the addition of cosubstrates.

Keywords: Aerobic, Anoxic, Degradation, Red B Dye, *Bacillus sp. OY1-2*

? Mustafa, S., Murtaza, S., Naeem, A. and Farina, K. (2005), Ion exchange sorption of Pb2+ ions on CrPO4. *Environmental Technology*, **26** (4), 353-359.

Full Text: [2005\Env Tec26, 353.pdf](2005/Env%20Tec26,%20353.pdf)

Abstract: The chromium(III) phosphate was observed to have a high affinity towards Pb2+ ion and the sorption capacities were found to be in the order: Pb2+ > Cu2+ > Cd2+ > Ni2+. Different characterization methods i.e. FTIR, SEM and EDX were employed to investigate the sorption mechanism of Pb2+ by chromium(III) phosphate, which showed that no new solid phases were present in the residue after sorption of Pb2+. The exchange between protons from the surface and Pb2+ from solutions was found to be responsible for Pb2+ sorption by chromium(III) phosphate.

Keywords: Affinity, AlPO4, Cd2+, Characterization, Chromium, Chromium(III) Phosphate, Cu2+, EDX, FTIR, Ion, Ion Exchange, Lead Ions, Mechanism, Methods, Pb2+, Phosphate, Residue, SEM, Sorption, Sorption Mechanism, Surface

? Argun, M.E., Dursun, S., Gür, K., Özdemir, C., Karataş, M. and Doğan, S. (2005), Nickel adsorption on the modified pine tree materials. *Environmental Technology*, **26** (5), 479-487.

Full Text: [E\Env Tec26, 479.pdf](E/Env%20Tec26,%20479.pdf)

Abstract: Removal of nickel ions from aqueous solutions containing 1-100 mg l-, using pine tree (Pinus nigra) materials modified with HCl, was investigated on a laboratory scale. For this purpose, two natural adsorbents such as the modified pine bark (MPB) and the modified pine cone (MPC) materials with HCl solution were studied. At first, the required concentration level of the HCl solution for the modification was observed, and then this was followed by the determinations of optimum levels of adsorbent amount, stirring rate, contact time and pH values. Various adsorption isotherms were also obtained by using different concentrations of the heavy metal cations tested in the experiment. As a result, the maximum removal efficiency levels obtained were as follows, 97% for the modified pine bark at pH 8 and 80% for the modified pine cone at pH 8.

Keywords: Adsorption, Adsorption Isotherms, Aqueous-Solution, Biomass, Biosorption, Concentration, Efficiency, Experiment, HCl, Heavy Metal, Heavy-Metals, Ions, Isotherm, Isotherms, Materials, Modification, Natural, Nickel, pH, pH Values, Pine, Pine Bark, Recovery, Removal, Removal Efficiency, Sawdust, Scale, Sulfate-Solutions, Tree, Waste-Water

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Full Text: [2005\Env Tec26, 615.pdf](2005/Env%20Tec26,%20615.pdf)

Abstract: Biosorption has distinct advantages such as high efficiency and cost-effectiveness for removal of metal ions from wastewater. However, most studies of bacterial biosorption have focused on the removal of a single metal ion from aqueous solutions, even though natural water and wastewater rarely contain only one kind of heavy metal. This study investigated competitive biosorption of Co2+, Ni2+, and Cr3+ in different combinations at various concentrations under conditions of co-existence in a synthetic wastewater system utilizing the gram-negative bacterium Pseudomonas aeruginosa. In a binary system with Co2+ and Ni2+, the presence of the same concentration of dissolved Ni2+ led to a significant decrease in the amount of Co2+ adsorbed onto cells when compared with a single Co2+ system in which Ni2+ was absent. This result is most likely due to the similar competitive affinity of these equivalent cations for sorption sites located on the cells of the bacterium. However, the presence of Cr3+ with either Co2+ or Ni2+ led to a strong reduction in the uptake of each of these bivalent ions by cells, whereas Cr3+ adsorption was unhindered. Cr3+ also significantly inhibited the adsorption of both Co2+ and Ni2+ onto cells in a ternary system involving Co2+-Ni2+-Cr3+, with the order of preferential metal uptake being Cr3+ > Co2+ a Ni2+. Removal efficiency of the heavy metals reached 100 % at low concentrations ([Cr3+] = [Co2+] = [Ni2+]-20 μM) in a multi-metal system. The results of this study indicate that pre-determination of co-existing heavy metals in wastewater and examination of their competition for the sorption sites of biosorbents are required for the efficient removal of inorganic toxicants utilizing biosorption processes.

Keywords: Biosorption, Bioremediation, Pseudomonas Aeruginosa, Heavy Metal, Competition, Pseudomonas-Aeruginosa, Heavy-Metals, Biosorption, Ions, Accumulation, Uranium, Cells, Binding, Wall

? Min, J.E., Lee, T., Park, J.W. and Choi, J. (2005), Black shale as a sorbent for trichloroethylene and Cr(VI). *Environmental Technology*, **26** (6), 643-652.

Full Text: [2005\Env Tec26, 643.pdf](2005/Env%20Tec26,%20643.pdf)

Abstract: Black shale was examined as a natural sorbent for organic and inorganic contaminants. Trichloroethylene (TCE) could be removed well from the water by sorption onto the locally available black shale because of the high organic carbon content (5.2%) of the black shale in this study. Hexavalent chromium Cr(VI) was mainly removed by ionic sorption and reduction in batch and column experiments. Amphiphilic humic acid was also sorbed onto the black shale and could facilitate the sorption of TCE at the same time. Humic acid also enhanced the removal of Cr(VI) by reduction and sorption, but the amount of Cr(VI) adsorbed (mg kg-1) was smaller than that of TCE. Considering that the black shale in this study was used without any modifications and has a small surface area, black shale can be a cost-effective natural geosorbent and additive to remove organic contaminants and heavy metals.

Keywords: Shale, Trichloroethylene, Chromium, Humic Acid, Sorption

? Zhang, Y. and Banks, C. (2005), Factors affecting the removal of selected heavy metals using a polymer immobilised sphagnum moss as a biosorbent. *Environmental Technology*, **26** (7), 733-743.

Full Text: [2005\Env Tec26, 733.pdf](2005/Env%20Tec26,%20733.pdf)

Abstract: A hydrophilic polyurethane foam was used to immobilise dried sphagnum moss as a polymer/biomass matrix. This was then tested for its ability to remove Cu(II), Zn(II) and Pb(II) from aqueous solution. Further selected experiments using copper looked at factors which it was thought might affect the performance of the biosorbent. The optimum pH for Cu(II) and Zn(H) sorption was found to be in the range 6 - 7, whilst Pb(II) showed a more uniform sorption profile over the pH range 3 - 8. At pH values above 8 there was significant leaching of organic components from the immobilisation matrix. The immobilised biomass maintained around 90% of its sorption capacity over 10 repetitive cycles of sorption/desorption using HCl as a desorbent with typically > 95% metal ion recovery from each cycle. There were no marked differences in the maximum sorption capacities for Cu(II) using different biomass particle sizes in the immobilisation matrix, but the affinity of the immobilised biomass for Cu(II) decreased with increasing particle size. Alkali and alkaline-earth metal ions did not affect the heavy metal biosorption, but aluminium ion had a significant influence and itself could be adsorbed to a large extent. Acetic acid, urea, and carrageenan did not affect the maximum biosorption capacity of Cu(II), but carrageenan significantly reduced the affinity of biomass to metal ions probably as a result of its own biosorptive properties.

Keywords: Heavy Metal, Biosorption, Sphagnum Moss, Polyurethane, Immobilization, Chlorella-Vulgaris, Rhizopus-Arrhizus, Aqueous-Solutions, Waste-Waters, Biosorption, Biomass, Copper, Ions, Peat, Chitosan

? Barrera-Díaz, C., Almaraz-Calderón, C., Olguín-Gutiérrez, M.A.T., Romero-Romo, M. and Alomar-Pardavé, M. (2005), Cd(II) and Pb(II) separation from aqueous solution using clinoptilolite and *Opuntia* ectodermis. *Environmental Technology*, **26** (7), 821-830.

Full Text: [2005\Env Tec26, 821.pdf](2005/Env%20Tec26,%20821.pdf)

Abstract: This work presents the conditions for Pb(II) and Cd(II) removal from aqueous solution using two different sorbent materials, namely, clinoptilolite and *Opuntia* ectodermis, which were characterized before and after entering into contact with the metal-containing aqueous media, using scanning electron microscopy (SEM), thermal analysis (TGA) and surface area (BET). Metal removal was found to depend on the initial metal concentration in aqueous solution, pH and the mass/volume ratio. The Pb(II) and Cd(II) uptake process was maximum at pH 4 for both sorbents, which showed an adsorption capacity that was adequately described by the Freundlich adsorption isotherm. The Thomas model was used to describe the adsorption data from column studies, the sorption capacity was 12.21 Pb(II) mg per gram of *Opuntia* ectodermis, while 7.71 Pb(II) mg per gram of clinoptilolite were adsorbed, lower values were obtained for Cd(II) removal. It was demonstrated that the use of low cost materials for the treatment of Pb(II), and Cd(II), containing wastewater is an effective and economical alternative method.

Keywords: Cliniptilolite, Opuntia Ectodermis, Continuous Test, Pb(II) and Cd(II) Removal

? Cougnaud, A., Faur, C. and Le Cloirec, P. (2005), Removal of pesticides from aqueous solution: quantitative relationship between activated carbon characteristics and adsorption properties. *Environmental Technology*, **26** (8), 857-866.

Full Text: [2005\Env Tec26, 857.pdf](2005/Env%20Tec26,%20857.pdf)

Abstract: The adsorption of pesticides (atrazin, atrazin-desethyl and triflusulfuron-methyl) from aqueous solution is performed by activated carbon fibers (ACF) and granular activated carbons (GAC) in static and dynamic reactors, in order to study the co-influence of adsorbent and adsorbate characteristics on the adsorption mechanisms. First, mono-component adsorption equilibrium is carried out in a batch reactor for a wide range of concentrations (from 5 μg l-1 to 21.4 mg l-1). Classic models, like Freundlich and Langmuir equations, are applied: the maximum adsorption capacities are high, ranging between 63 and 509 mg g-1. The comparison of single-solute isotherms tends to confirm the decisive role of the adsorbent properties in the adsorption capacity of pesticides by the activated carbons: the performance of ACF is significantly higher than that of GAC due to a narrower pore size distribution of fibers in the area of micropores. Furthermore, their small diameter (10 μm compared with 1 mm for grains) enables faster adsorption kinetics because of the larger surface area exposed to the fluid. The influence of adsorbate size is also demonstrated. A multiple linear regression enables the co-influence of adsorbent and adsorbate properties to be quantified, a relationship being assessed between Langmuir maximum adsorption capacity and pesticide molecular weight and adsorbent diameter (*R2* = 0.90). Secondly, the adsorption of the three pesticides is studied in a dynamic reactor: in this case, the influence of operating conditions (inlet concentration *C0*, flow velocity *U0*) is also taken into account. As the initial concentration or flow velocity decreases, the column performance significantly improves. Both operating factors are included in a multiple linear regression (*R2* = 0.91) used to predict saturation adsorption capacity, with molecular weight and particle diameter being again designed as influent explicative variables.

Keywords: Activated Carbon, Adsorption, Multiple Linear Regression, Pesticides, Water Treatment

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Full Text: [2005\Env Tec26, 877.pdf](2005/Env%20Tec26,%20877.pdf)

Abstract: Thermal treatment of metal finishing waste with locally available clay, in their varying ratios, was carried out at 850°C and above temperatures. In the presence of 1:1 ratio of waste and clay a solidified product was obtained at 950°C. Measurement of an appreciably high compressive strength, ~500 kg cm-2 and a very small (0.4%) water absorption from the solidified product indicated its stable nature. Toxicity Characteristic Leaching Procedure (TCLP) test of the waste showed nearly 85 to 90% decrease of leaching of Fe, Cu, Ni, Zn, Mn and Cr after thermal treatment compared to their leaching without treatment. No hexavalent chromium{Cr(VI)} was observed from the leachate of the solidified product. This indicates the absence of re-oxidation phenomena of chromium during thermal treatment up to 950°C. X - ray diffraction (XRD) of solidified product indicated the presence of hematite, and aluminum silicate as main phases of the solidified product. Involvement of the above waste metals with these phases during thermal treatment could be the reason for their immobilization.

Keywords: Thermal Treatment, Solidification, Leachability, Heavy Metals

? Karanfil, T., Moro, E.C. and Serkiz, S.M. (2005), Development and testing of a silver chloride-impregnated activated carbon for aqueous removal and sequestration of iodide. *Environmental Technology*, **26** (11), 1255-1262.

Full Text: [2005\Env Tec26, 1255.pdf](2005/Env%20Tec26,%201255.pdf)

Abstract: Silver impregnated activated carbon (SIAC) can effectively remove iodide from water and sequester it in the form of Agl((s)), Given the extremely insoluble nature of AgI(s), the spent SIAC can be safely disposed of in land burial facilities. However, when the molar ratio of silver to iodide is greater than one, which is typical for waters contaminated with iodide, unreacted silver on the SIAC leached into solution with decreasing pH. To minimize silver leaching, a silver chloride impregnated activated carbon (SIAC-Cl) was produced from a SIAC. Scanning electron microscopy (SEM), energy-dispersive X-ray (EDX) and X-Rav Diffraction (XRD) analyses confirmed the presence of silver chloride on the SIAC-Cl. Batch isotherm experiments conducted at pH 5, 7 and 8 showed that the iodide uptakes of SIAC-Cl and SIAC were similar and independent of pH. SEM/EDX and XRD analyses after reaction with iodide indicated that chloride was exchanged with iodide to form AgI(s), on the SIAC-Cl. Batch leaching experiments demonstrated that leaching of silver from SIAC-Cl under acidic conditions was significantly lower than from SIAC. The performance of SIAC and SIAC-Cl for practical applications was evaluated by conducting column experiments using a radioactively contaminated groundwater that included 129I. STAC and SIAC-Cl showed similar degrees of iodide uptake. However, a significant degree of silver leaching, about 50% of the total silver, occurred from the SIAC during the course of the column experiments, whereas silver leaching from SIAC-Cl was remarkably low (only 6% of the total silver). SIAC-Cl appears to be a suitable getter material to remove and sequester iodide from contaminated waste streams.

Keywords: Acidic Conditions, Activated Carbon, Adsorption, Applications, Carbon, Chloride, Course, EDX, Electron Microscopy, Groundwater, Hazardous Waste, Isotherm, Leaching, Low, Microscopy, Performance, pH, Reaction, Removal, SEM, Sequestration, Silver, Streams, Surface Modification, Testing, Uptake, Waste, Water, Water Treatment, Waters, XRD

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Full Text: [2006\Env Tec27, 15.pdf](2006/Env%20Tec27,%2015.pdf)

Abstract: The effectiveness of adsorption for nickel removal from wastewater had made it an ideal alternative to other expensive treatment options. This paper deals with an investigation on coir based adsorbent (Puresorbe) in the removal of nickel from the aqueous solutions. The adsorption of nickel was carried out by varying the parameters such as agitation time, metal concentration, adsorbent dose, temperature and pH. The experimental isotherm data were analyzed using the Langmuir and Freundlich isotherms. Adsorption followed a second order rate expression for the particle size 250-500 µm at pH 6. The monolayer adsorption capacity was 15.31 mg nickel per gram of puresorbe. Thermodynamic parameters show the endothermic nature of nickel adsorption. A desorption study carried out using distilled water adjusted to pH of 2-10, suggests that ion exchange might be the mode of adsorption.

Keywords: Adsorption Isotherm, Coir Based Adsorbent, Adsorption Kinetics, Second Order Kinetics, Thermodynamic Studies, Heavy-Metals, Waste-Water, By-Products, Removal, Ions, Sorption, Peat, Biosorption, Copper(II), Lead(II)

? Utomo, H.D. and Hunter, K.A. (2006), Adsorption of divalent copper, zinc, cadmium and lead ions from aqueous solution by waste tea and coffee adsorbents. *Environmental Technology*, **27** (1), 25-32.

Full Text: [2006\Env Tec27, 25.pdf](2006/Env%20Tec27,%2025.pdf)

Abstract: The adsorption of the divalent cations of Cu, Zn, Cd and Pb by tea leaves and coffee grounds from aqueous solutions is described. Both adsorbents exhibited strong affinity for these ions which could be described by a simple single-site equilibrium model. For coffee, the order of increasing adsorption equilibrium constant K was Cu < Pb < Zn < Cd, while for tea the opposite order was observed indicating that the adsorption sites on each adsorbent have a different chemical nature. Adsorption decreased at low pH < 4 through competition with H+ for adsorption sites, and for all metals except Cu, at high pH > 10, probably because of anion formation in the case of Zn2+ and also increased leaching of metal-binding soluble materials. The effect of metal ion concentration on the adsorptive equilibria indicated a threshold concentration above which overall adsorption became limited by saturation of the adsorption sites. Competition between two metal ions for the same sites was not observed with Cu(II) and Pb(II), however Zn(II) reacted competitively with Cd(II) binding sites on both tea and coffee. If fresh coffee or tea adsorbents were used, the fraction of metal ion taken up by the adsorbent was diminished by the competitive effects of soluble metal-binding ligands released by the tea or coffee. Experiments with coffee showed that roasting temperature controls the formation of metal ion adsorption sites for this adsorbent.

Keywords: Adsorbent, Adsorption, Cu, Equilibrium, Heavy-Metals, Metal Ions, Pb, Removal

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Full Text: [2006\Env Tec27, 923.pdf](2006/Env%20Tec27,%20923.pdf)

Abstract: Removal of molybdate on to industrial solid waste Fe(III)/Cr(III) hydroxide as adsorbent has been investigated. Pretreated adsorbent was found to be more efficient in the uptake of molybdate compared to untreated adsorbent. Effect of pH on the adsorption was studied in the pH range 4.0 to 10.0. Optimum pH for maximum removal was found to be 4.0. Langmuir and Freundlich isotherm models were used to study the adsorption capacity of the adsorbent. The adsorption follows second order kinetics. No significant effect of temperature has been observed. Desorption studies showed that ion exchange mechanism is predominant.

Keywords: Adsorption, Fe(III)/Cr(III) Hydroxide, Molybdate, Isotherms, Kinetics, Aqueous-Solution, Competitive Adsorption, Molybdenum Adsorption, Removal, Phosphate, Water, Sorption, Soils, Gamma-Al2O3, Minerals

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Full Text: [2006\Env Tec27, 979.pdf](2006/Env%20Tec27,%20979.pdf)

Abstract: Industrial wastes containing synthetic organic compounds and heavy metals are among the most dangerous residues, whose growth has followed the increase in industrial activity. Heavy metals are readily assimilated into the food chain and therefore easily accumulated in the ecosystem. To remove heavy metals from aqueous solutions, marine algae may be used as adsorbents either in their natural form or after treatments by a cross-linking process to improve their mechanical resistance. Drying of biosorbents, such as marine algae, is mentioned in many previous works as a step preceding the adsorption/dessorption cycle. Concerning algae, drying of its fresh biomass allows for proper storage and enhances performance in the sorption of heavy metals. In this work, physical and morphological analyses of fresh and dried Sargassum sp. marine algae, harvested offshore Sao Sebastiao, Sao Paulo state, Brazil, were performed in order to assess the influence of drying conditions on the biosorption process. Chromium concentrations were also determined in different parts of the algal structure before and after the biosorption process. The drying promoted structural changes in the algae, like shrinkage and porosity reduction. It was also observed that the chromium retention was dependent on the structural arrangement of the alga parts, in which the leaf was the major biosorbent.

Keywords: Adsorption, Alga Drying, Biomass, Biosorption, Biosorption, Biosorption By Algae, Brazil, Chromium, Heavy Metals, Hexavalent Chromium, Ion-Exchange, Marine-Algae, Metals, Protons, Sargassum, Sorption

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Full Text: [2006\Env Tec27, 1081.pdf](2006/Env%20Tec27,%201081.pdf)

Abstract: In the present study freshly precipitated spent alum sludge [15-75 mg Al l-1] and alum [3-15 mg Al l-1] were tested and compared for their efficiency to remove phosphorus in synthetic wastewater [10mg P l-1, 25°C, pH=6] and it was proven that pure alum is much more efficient at phosphorus removal than the spent alum sludge. The effect of the pH on phosphorus removal efficiency was studied and it was proven that maximum orthophosphate removal is achieved in pH values 5-6 in both cases, alum and spent alum sludge, although alum is efficient in a wider pH range (4-7). The effect of aging [up to two months at 25°C] on the efficiency of the spent sludge to remove phosphorus in synthetic wastewater was studied and it was proven that this efficiency is decreased through aging (up to 20% for 2 months aging). X-ray diffraction was used in order to examine whether this decrease is caused by changes in the structure of adsorbent and a mechanism was proposed to explain the above changes. Kinetics was investigated in the case of fresh and aged spent alum sludge and the pseudo-second-order chemisorption rate equation fits satisfactorily the experimental data [k: 0.286-1.048 g mmol-1 min-1, at 23-26°C]. Finally, equilibrium was studied for fresh and aged spent alum sludge and the Freundlich isotherm fitted best the experimental data suggesting heterogeneous sorption [K-F=14.4-19.7, N: 0.13-0.20].

Keywords: Orthophosphate, Elovich, Lagergren, Pseudo-Second-Order Kinetics, Low Cost Adsorbent

? Homem, E.M., Vieira, M.G.A., Gimenes, M.L. and Silva, M.G.C. (2006), Nickel, lead and zinc removal by adsorption process in fluidised bed. *Environmental Technology*, **27** (10), 1101-1114.

Full Text: [2006\Env Tec27, 1101.pdf](2006/Env%20Tec27,%201101.pdf)

Abstract: This work presents an experimental study of nickel(II), lead(II) and zinc(II) metallic ions removal by adsorption in zeolite Baylith WE984. The experiments were conducted in a fluidised-bed rig with 300 grams of zeolite particles having diameter in the range 1 - 4mm. The volumetric flow rate of the fluidizing solution was 4.1 lmin-1. Metal concentrations in the solution were measured by atomic absorption and the breakthrough curves were obtained for concentrations of metals ranging from 5 to 30 ppm (pH = 2). Experimental results obtained were fitted to the Renken model for analysis of the mass transfer resistance and the kinetic of adsorption. It was verified that the kinetic of adsorption was the limiting factor for the metallic ion retention in fluidised bed. Competitiveness of the metals adsorbed into Baylith zeolite were also analyzed being found the following order of preference for the metal removals: nickel > zinc > lead. The competitiveness was evaluated simultaneously in the combination of 2 x 2 and the three metals.

Keywords: Fluidised Bed, Metal Adsorption, Removal Process, Adsorption Process, Removal Heavy Metals, Heavy-Metals

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Full Text: [2007\Env Tec28, 453.pdf](2007/Env%20Tec28,%20453.pdf)

Abstract: This study investigated the biosorption kinetics and equilibrium of cadmium, nickel and zinc by activated sludge from a biological nutrient removal (BNR) process. A series of batch experiments with different initial metal concentrations were conducted to determine the metal removal in BNR sludge. The harvested sludges were from a continuous-flow anaerobic-anoxic-oxic (A2O) system operated under a 10 days of sludge retention time. Batch tests were specially designed to isolate the precipitation effects of metal ions in solution so as to compare the isotherm constants of biosorption with and without precipitation isolation. Experimental results revealed that BNR sludge exhibited two stages of biosorption, i.e., passive and then active uptake, for all three metals. The biosorption kinetic data of three tested metals can be effectively simulated by pseudo-second-order rate equations. Besides, the biosorption isotherm showed that metal biosorption behavior was statistically in agreement with the Freundlich model. The capacity constants k of the Freundlich model for Cd, Ni and Zn are 0.50, 0.23 and 0.41; the affinity constants 1/n are 0.96, 0.81 and 0.31, respectively. Additionally, precipitation behaviors of metals obviously should be carefully examined during biosorption batch tests with activated sludge; otherwise the biosorption effect could be significantly overestimated.

Keywords: Activated Sludge, Activated-Sludge, Adsorption, Adsorption Kinetics, Affinity, Anaerobicanoxic-Oxic (A20) Process, Bacterial Extracellular Polymers, Batch, Batch Experiments, Batch Tests, Behavior, Biological Nutrient Removal, Biological Nutrient Removal (BNR) Process, Biomass, Biosorption, Biosorption Kinetic, Biosorption Kinetics, Bnr, Cadmium, Capacity, Carbon, Cd, Concentrations, Constants, Culture, Effects, Equations, Equilibrium, Experiments, Freundlich, Freundlich Model, Heavy Metal Biosorption, Heavy-Metals, Isolation, Isotherm, Isotherm Constants, Kinetic, Kinetics, Kinetics and Equilibrium, Metal, Metal Biosorption, Metal Ions, Metal Removal, Metal Uptake, Metals, Model, Ni, Nickel, Nutrient, Nutrient Removal, Precipitation, Process, Pseudo Second Order, Pseudo-Second-Order, Rate, Removal, Retention, Retention Time, Sludge, Sludge Retention Time, Sludges, Sorption, Tests, Time, Uptake, Zinc, Zn, Zoogloea-Ramigera

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Full Text: [2007\Env Tec28, 785.pdf](2007/Env%20Tec28,%20785.pdf)

Abstract: In this study, the phosphate sorption characteristics of zirconium meso-structures synthesized under different conditions were estimated. X-ray diffraction analysis, phosphate sorption isotherm test and kinetic test were performed for the zirconium meso-structures, synthesized at different inorganics/surfactant molar ratio and with different surfactant (C(x)TMA-Br) templates. From the test results, it was found that at the inorganic/surfactant molar ratio of 1/0.50 the meso-pores in the material were most uniformly and clearly formed and thus the sorption capacity and reaction rate of material were maximized. The pore size in meso-structure decreased with the increase in chain length of surfactant template used, and maximum phosphate sorption amount and reaction rate were achieved in the zirconium mesostructure synthesized with the surfactant of dodecyltrimethylammonium bromide (C(12)TMA-Br).

Keywords: Sorbent, Ion Exchange, Resource Recovery, Water Treatment, Waste-Water, Removal, Phosphorus, Adsorbent, Recovery

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Full Text: [2008\Env Tec29, 111.pdf](2008/Env%20Tec29,%20111.pdf)

Abstract: In the present work, waste products from forest industries (sawdust, pine bark and fibre sludge ash), as well as some biological materials (peat, shrimp shells and seaweed), have been investigated with respect to their capacities to adsorb metals and hydrocarbons from contaminated waters. Batch and column experiments were carried out with artificial metal ion solutions and contaminated leachates from an industrial landfill. The fibre sludge ash and the Sphagnum peat showed the highest sorption capacities for metals among the materials studied in batch experiments with single-metal solutions. The uptake of metals by the fibre ash for the metals studied was: Cu and Pb 112 mu g g-1, Zn 115 mu g g-1 and Cr 97 mg g-1. For peat the uptake was: Pb 109 mu g g-1, Cu 105 mu g g-1, Zn 100 mu g g-1 and Cr 99 mu g g-1. These materials were also effective in adsorption of diesel oil, and the n-alkanes C-16 and C-12. Peat and ash adsorbed respectively 36.6 and 36.4 mg g-1 of C-12, 1.84 and 1.94 mg g-1 of C-16 and for both 0.98 mg g-1 of diesel oil. Bark adsorbed diesel oil to 0.83 mg g-1. In the column experiments, the removal of metals from a contaminated landfill leachate by ash and peat was lower than from artificial solutions with only a few metals. The results suggest interference from other components in the leachates, such as competition of ions for the same active sites. It is quite clear that laboratory tests can overestimate the performance of adsorbents and that experiments should be specific for the intended application. For most of the metals studied in columns, peat appeared to be the best adsorbent, with respect to both sorption capacity and service time, The addition of 10 % by weight of fibre ash to the peat gave higher adsorption capacities for Cd, Ni and Pb but lower for the Cu and Zn.

Keywords: Adsorption, Heavy Metals, Hydrocarbons, Fibre Ash, Sphagnum Peat, Sphagnum Moss Peat, Waste-Water, Fly-Ash, Aqueous-Solutions, Spruce Sawdust, Removal, Sorption, Column, Copper, Ions

? Zhuang, J.M., Hobenshield, E. and Walsh, T. (2008), Arsenate sorption by hydrous ferric oxide incorporated onto granular activated carbon with phenol formaldehyde resins coating. *Environmental Technology*, **29** (4), 401-411.

Full Text: [2008\Env Tec29, 401.pdf](2008/Env%20Tec29,%20401.pdf)

Abstract: A simple and effective method was developed using phenol formaldehyde (PF) resins to immobilize hydrous ferric oxide (HFO) onto granular activated carbon (GAC). The resulting sorbent possesses advantages for both the ferric oxide and the GAC, such as a great As-affinity of ferric oxide, large surface area of GAC, and enhanced physical strength. The studies showed that within one hour this sorbent was able to remove 85% of As(V) from water containing an initial As(V) concentration of 1.74 mg l-1. The As(V) adsorption onto the sorbent was found to follow a pseudo-second order kinetics model. The adsorption isotherms were interpreted in terms of the Langmuir and Freundlich models. The equilibrium data fitted very well to both models. Column tests showed that this sorbent was able to achieve residual concentrations of As(V) in a range of 0.1-2.0 mu g l-1 while continuously treating about 180 bed volume (BV, 130 ml-BV) of arsenate water with an initial As(V) concentration of 1886 mu g l-1 at a filtration rate of 13.5 ml min-1, i.e., an empty bed contact time (EBCT) of 9.6 min and a gram sorbent contact time (GSCT) of 0.15 min. After passing 635 BV of arsenate water, the exhausted sorbent was then tested by the Toxicity Characteristic Leaching Procedure (TCLP, US EPA Method 1311) test, and classified as nonhazardous for disposal. Hence, this HFO-PF-coated GAC has the capability to remove As(V) from industrial wastewater containing As(V) levels of about 2 mg l-1.

Keywords: Activated Carbon, Adsorbents, Adsorption, Adsorption, Adsorption Isotherms, Arsenate, Arsenic, Arsenite, As(V), As(V) Adsorption, Bangladesh, Carbon, Coating, Drinking-Water, Equilibrium, Filtration, Formaldehyde, Formaldehyde Resins, Freundlich, Gac, Granular Activated Carbon, Hydrous Ferric Oxide, Hydroxide, Isotherms, Kinetics, Kinetics Model, Langmuir, Mobility, Model, Models, Oxide, Pf Resins, Phenol, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Removal, Resins, Sorbent, Sorption, Surface Area, Technologies, Toxicity, US, Wastewater, Water

? Boddu, V.M., Abburi, K., Fredricksen, A.J., Maloney, S.W. and Damavarapu, R. (2009), Equilibrium and column adsorption studies of 2,4-dinitroanisole (DNAN) on surface modified granular activated carbons. *Environmental Technology*, **30** (2), 173-181.

Full Text: [2009\Env Tec30, 173.pdf](2009/Env%20Tec30,%20173.pdf)

Abstract: 2,4-Dinitroanisole (DNAN) is used as a component extensively in the development of insensitive munitions. This may result in release of DNAN into the environment. Here, the results are reported of a study on the removal characteristics of DNAN through adsorption on granular activated carbon (GAC), chitosan coated granular activated carbon (CGAC), acid treated granular activated carbon (AGAC) and alkali treated granular activated carbon (BGAC) under equilibrium and column flow conditions. The effect of pH, contact time, concentration of DNAN, and presence of electrolytes on the uptake of DNAN by the adsorbents was investigated. The equilibrium data were fitted to different types of adsorption isotherms. The data were further analysed on the basis of Lagergren first-order, pseudo second-order and intraparticle diffusion kinetic models. Breakthrough curves were obtained based on column flow results. All the adsorbents were capable of removing about 99% of DNAN from aqueous media, except CGAC which adsorbed about 87% of DNAN.

Keywords: Activated Carbon, Adsorption, Chitosan, Dnan, Explosives, Insensitive Munitions, Oxidation, Reactor, Removal, Soil, TNT, Waste-Water

? Xing, Y. and Wang, G.F. (2009), Poly(methacrylic acid)-modified sugarcane bagasse for enhanced adsorption of cationic dye. *Environmental Technology*, **30** (6), 611-619.

Full Text: [2009\Env Tec30, 611.pdf](2009/Env%20Tec30,%20611.pdf)

Abstract: The preparation of poly(methacrylic acid)-modified sugarcane bagasse (SB) and its application for the removal of the cationic dye malachite green (MG) in aqueous solution in a batch system is described. The modified SB was characterized using SEM and FTIR analysis. The effects of the pH of the solution, contact time and initial dye concentration were studied. The adsorption capacity of the adsorbent for MG increased significantly after the modification as a large number of carboxyl groups were introduced. The equilibrium process was better described by the Langmuir than the Freundlich isotherm. According to the Langmuir equation, the maximum adsorption capacity was 103.2 mg g-1 for MG. Kinetic studies showed better correlation coefficients for a pseudo-second-order kinetic model, confirming that the adsorption rate was controlled by a chemisorption process.

Keywords: Activated Carbon, Adsorption, Aqueous-Solutions, Basic Dye, Biosorption, Malachite Green, Malachite-Green, Methylene-Blue, Modified, Poly(Methacrylic Acid), Potassium Persulfate, Redox Initiator, Removal, Sorption, Sugarcane Bagasse

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Full Text: [2009\Env Tec30, 737.pdf](2009/Env%20Tec30,%20737.pdf)

Abstract: In this research, experiments were conducted to study Pb2+ sorption onto engineered iron-oxide-coated sand (IOCS) and iron-oxide-coated crushed brick (IOCB), as well as onto naturally iron-oxide-coated sand (NIOCS). Optical and scanning electron microscopy (SEM) analyses were realised to investigate the surface properties and morphology of the coated sorbents. Infrared spectroscopy and X-ray diffraction techniques were also used to characterise the sorbent structures. Adsorption of lead from synthetic aqueous solutions was investigated by batch experiments. Results show that adsorption is slightly dependent on pH. The maximum adsorption capacity obtained at pH 6 was 5, 5.5 and 2.9 mg g-1 for IOCS, IOCB and NIOCS, respectively. Both Freundlich and Langmuir isotherms can describe experimental data. The influence of temperature on the adsorption process was also evaluated. Results indicated that adsorption of Pb2+ on the three sorbents is endothermic. The thermodynamic parameters (G, H and S) for Pb2+ sorption on all considered sorbents were also determined from the temperature dependence. All considered sorbents could be an alternative emerging technology for water treatment without any side effects or treatment process alterations. However, IOCB has the best performances due to its greater capacity for the retention of lead.

Keywords: Activated Carbon, Adsorption, Adsorption Properties, Contaminated Water, Copper, Filter Media, Humic-Acid, Iron-Oxide-Coated Sorbents, Isotherm, Lead, Metal-Ions, Removal, Sand, Sorption, Surface-Coatings

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Full Text: [2009\Env Tec30, 1023.pdf](2009/Env%20Tec30,%201023.pdf)

Abstract: Chromium(VI) is known to be potentially carcinogenic and mutagenic in humans. A low-cost industrial solid bioadsorbent, bagasse-based activated charcoal (BAC), has been investigated for removal of chromium from aqueous solution. All the experiments were carried out in batch process with laboratory-prepared samples to study the effects of adsorbent dose, contact time, pH and initial concentration of Cr(VI). The removal of chromium ion was found to be highly dependent on the pH of the solution, adsorbent dose and contact time. Also the equilibrium adsorption was analyzed by the Freundlich and Langmuir isotherm models. It was found that the Freundlich isotherm model best described the sorption of chromium by sugar beet bagasse-based activated charcoal (r2 0.9927). Experimental data of kinetic studies were fitted to pseudo-first-order, pseudo-second-order and modified pseudo-first-order models. The results showed pseudo-second order kinetics was best fitted to the collected data (r2 0.9893). Optimum conditions for adsorption were determined at pH 2 and a contact time of 180 minutes (92.7% removal). These retention capacities suggest that BAC can provide a simple, effective, and cheap method for removing Cr(VI) ions from effluents and water resources.

Keywords: Activated Charcoal, Adsorbent, Adsorbent Dose, Adsorption, Aqueous Solution, Bagasse, Batch, Batch Process, Biosorbent, Biosorption, Carbon, Chromium, Concentration, Cr(VI), Cr(VI), Data, Drinking-Water, Effluents, Equilibrium, Experiments, Freundlich, Freundlich Isotherm, Freundlich Isotherm Model, Hexavalent Chromium, Humans, Ions, Isotherm, Isotherm Model, Isotherms, Kinetic, Kinetic Studies, Kinetics, Langmuir, Langmuir Isotherm, Low Cost, Mechanism, Model, Models, Modified, pH, Pseudo First Order, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First-Order, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Removal, Retention, Solution, Sorption, Surface-Properties, Waste-Water, Water, Water Resources

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Full Text: [2009\Env Tec30, 1059.pdf](2009/Env%20Tec30,%201059.pdf)

Abstract: The macroporous polystyrene anion exchangers Amberlite IRA-900 and Amberlite IRA-910 were used in order to remove sulphonated azo dyes (Allura Red and Sunset Yellow) from aqueous solutions of 100-500 mg/L concentrations. The experimental data obtained at 100, 200, 300 and 500 mg/L initial concentrations at 20°C were applied to the pseudo-first-order, pseudo-second-order and Weber-Morris kinetic models. The calculated sorption capacities (qe,cal) and the rate constant of the first-order adsorption (k1) were determined. The pseudo-second-order kinetic constants (k2) and capacities were calculated from the plots of t/qt vs t, 1/qt vs 1/t, 1/t vs 1/qt, qt/t vs qt and 1/qe-qt vs t for type 1, type 2, type 3, type 4 and type 5 of the pseudo-second-order expression, respectively. The influence of phase contact time, initial dye concentration, solution pH and temperature on Allura Red and Sunset Yellow removal was also discussed.

Keywords: Activated Carbon, Adsorption, Anion Exchangers, Aqueous Solutions, Aqueous-Solutions, Azo Dyes, Azo-Dyes, Concentration, Data, Dye, Dyes, Experimental, Expression, First Order, Kinetic, Kinetic Models, Kinetics, Liquid-Chromatography, Macroporous, Malachite Green, Methylene-Blue, Models, Nonlinear-Regression Analysis, pH, Polystyrene, Pseudo First Order, Pseudo Second Order, Pseudo-First-Order, Pseudo-Second-Order, Rate Constant, Reactive Dyes, Removal, Rice Husk, Solution, Solutions, Sorption, Sorption Kinetics, T, Temperature, Textile Wastewaters

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Full Text: [2010\Env Tec31, 97.pdf](2010/Env%20Tec31,%2097.pdf)

Abstract: The aim of this study was to examine the adsorption potential of lychee (Litchi chinensis) peel waste for the removal of Acid Blue 25 dye from aqueous solutions. The adsorption was studied as a function of contact time, initial dye concentration and temperature by batch method. Equilibrium sorption isotherms showed that the lychee peel adsorbent possessed a high affinity and sorption capacity for Acid Blue 25, with a monolayer sorption capacity of ca. 200 mg g-1. The equilibrium adsorption data were well described by the Langmuir model. Kinetic studies revealed that the present system of dye adsorption on lychee peel adsorbent could be described more favourably by the pseudosecond-order kinetic model. The thermodynamic parameters, namely free energy (ΔGº), enthalpy (ΔHº) and entropy (ΔSº) changes, were determined for the process. The results of the present study suggest that lychee peel waste can be used beneficially as an adsorbent in treating industrial effluents containing dyes.

Keywords: Acid Blue 25, Acid Blue 25 Dye, Activated Carbons, Adsorbent, Adsorbents, Adsorption, Aqueous Solutions, Aqueous-Solutions, Banana Peel, Batch, Batch Method, Beta-Cyclodextrin, Biosorption, Biosorption Characteristics, Capacity, Changes, Characteristics, Concentration, Data, Dye, Dye Adsorption, Dyes, Effluent, Effluents, Energy, Enthalpy, Entropy, Equilibrium, Equilibrium Isotherms, Function, Isotherms, Kinetic, Kinetic Model, Kinetic Modelling, Kinetic Studies, Langmuir, Langmuir Model, Lychee (Litchi Chinensis), Model, Monolayer, Orange Peel, Peel Waste, Potential, Pseudosecond-Order, Removal, Solutions, Sorption, Sorption Capacity, Sorption Isotherms, Surface, Temperature, Thermodynamic, Thermodynamic Parameters, Waste, Water, Wood

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Full Text: [2010\Env Tec31, 267.pdf](2010/Env%20Tec31,%20267.pdf)

Abstract: Adsorption has been found to be effective for the removal of dyes from effluent; however, the contaminant will cause secondary pollution if it is not properly treated. In this paper, the ability of lava as a low-cost adsorbent and catalyst for the removal of a commercial dye, Methylene Blue (MB), from aqueous solution has been investigated under various experimental conditions. It was found that lava had a high efficiency (more than 98%) for MB removal by adsorption. The adsorption equilibrium data can be fitted well by the Langmuir adsorption isotherm model. The adsorption kinetics was shown to be pseudo-second-order. After adsorption the contaminant could be catalysis oxidized by lava with the aids of H2O2 and ultrasound. The result showed that 95% of the MB could be decomposed in 100 min with the aid of ultrasound at 85 W/cm(2). Overall, this study demonstrates lava as a promising material for wastewater treatment to remove and decompose dyes in a single treatment step.

Keywords: Adsorbent, Adsorption, Adsorption Equilibrium, Adsorption Isotherm, Adsorption Isotherm Model, Adsorption Kinetics, Aids, Aqueous Solution, Aqueous-Solutions, Basic-Dyes, Catalysis, Catalysis Oxidation, Catalyst, Congo Red, Contaminant, Data, Degradation, Dye, Dyes, Efficiency, Equilibrium, Experimental, H2O2, Isotherm, Isotherm Model, Kinetics, Langmuir, Langmuir Adsorption Isotherm, Lava, Low Cost, Low Cost Adsorbent, Low-Cost Adsorbent, Low-Cost Adsorbents, Mb, Methylene Blue, Model, Modified Zeolites, Oxidation, Pollution, Pseudo Second Order, Pseudo-Second-Order, Reactive Dye, Removal, Removal of Dyes, Shell, Solution, Treatment, Ultrasound, Waste, Wastewater, Wastewater Treatment

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Full Text: [2010\Env Tec31, 745.pdf](2010/Env%20Tec31,%20745.pdf)

Abstract: Chitosan-g-poly(acrylic acid)/attapulgite composite with 30 wt% attapulgite content was used to remove Cd(II) from aqueous solutions. The parameters influencing the adsorption were investigated. When Cd(CH3COO)2 was used as the solute of the solution, the equilibrium adsorption capacity was evidently larger than that of the other three cadmium salts (Cd(NO3)2, CdCl2, CdSO4). Results from kinetic experiments showed that the rate of Cd(II) adsorption on the composite was quite fast, more than 90% of Cd(II) adsorption occurred within the initial 3 min, and the adsorption equilibrium may be reached within 10 min. The adsorption process can be well described by the pseudo-second-order kinetic model. The equilibrium adsorption isotherm was fitted for not only the Langmuir model but also the Freundlich model. Fourier transform infrared spectra before and after adsorption of Cd(II) on the composite showed that complexation was considered as the main mechanism. To evaluate the reuse value of the composite, a consecutive adsorption-desorption process was performed five times, and the results implied that the composite has the potential for regeneration and reuse.

Keywords: Activated Palygorskite, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Adsorption Isotherm, Adsorption Mechanism, Adsorption-Desorption, Aqueous Solution, Aqueous Solutions, Attapulgite, Batch, Biomass, Cadmium, Cadmium, Capacity, Carbon, Cd(II), Cd(II) Adsorption, Chitosan, Complexation, Composite, Composite Hydrogel, Equilibrium, Experiments, Freundlich, Freundlich Model, Hydrogel, Isotherm, Kinetic, Kinetic Model, Langmuir, Langmuir Model, Lead, Mechanism, Model, Potential, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Regeneration, Removal, Reuse, Salts, Solution, Solutions, Sorption, Thermodynamic Parameters, Value

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Full Text: [2010\Env Tec31, 791.pdf](2010/Env%20Tec31,%20791.pdf)

Abstract: The higher oxidation state of iron, i.e. Fe(VI), was exploited to treat the synthetic wastewater containing Zn(II)-NTA. The decomposition of Zn(II)-NTA by Fe(VI) was investigated with the help of analytical data obtained for the change in Fe(VI) concentration, dissolved organic carbon (DOC) and total soluble Zn(II) concentration as a function of time at various concentrations of Zn(II)-NTA and at constant Fe(VI) concentration. The UV-Visible data was used to explain the reaction kinetics for redox reactions between Fe(VI) and Zn(II)-NTA. The pseudo-first-order rate constant was calculated keeping the Zn(II)-NTA concentration in excess and hence the overall second-order-rate constant was obtained. Fe(VI) reduction was almost unaffected with the 1000 times increase in ionic strength (NaNO3), as well as in the presence of completely oxidized background electrolytes. However, Fe(VI) reduction was greatly affected in the presence of both SO32- and NO2- especially at higher concentrations, indicating a competitive reduction took place between Zn(II)-NTA and Na2SO3 or NaNO2 in the Fe(VI) treatment. These results were again supported by the dissolved organic carbon observations since relatively very low removal of the dissolved organic carbon occurred in the presence of Na2SO3 and NaNO2.

Keywords: Acid, Adsorption, Aqueous Solutions, Carbon, Competitive, Complexes, Concentration, Cyanide, Data, Decomposition, Dissolved, Dissolved Organic Carbon, Doc, Fe(VI), Ferrate(VI) Oxidation, Function, Ionic Strength, Iron, Iron(VI), Kinetics, Mechanism, NO2, Organic, Organic Carbon, Oxidation, Pseudo First Order, Pseudo-First-Order, Rate Constant, Reaction Kinetics, Reduction, Removal, Solutions, State, Strength, Treatment, Wastewater, Water, Zn(II), Zn(II)-NTA

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Full Text: [2010\Env Tec31, 815.pdf](2010/Env%20Tec31,%20815.pdf)

Abstract: The adsorption of two basic dyes, CI Basic Yellow 28 and CI Basic Green 4, was studied in single and binary solute systems using two classes of inorganic-organic pillared clay granules as sorbents (300-400 μm and 700-800 μm). These were prepared by high-shear wet granulation from an Al cetyltrimethylammonium bromide intercalated clay powder (particle diameter 50 mu m). Adsorption rate data indicate that BY 28 adsorbs more rapidly than BG 4 and a pseudo-first-order model was found to fit the kinetic curves, with regression coefficients above 0.98. Adsorption isotherms in single solute systems at pH 3 and pH6 were respectively analysed according to the Langmuir and Freundlich models using non-linear regression. Best fits were obtained with the Langmuir model. In binary dye systems the adsorption at three molar ratios (1:9, 1:1 and 9:1) demonstrated that the adsorption of BG 4 was greater than that of BY 28 on all the sorbents studied; this was in agreement with the results obtained for single solute systems. Increasing the granule size decreased dye adsorption, an effect in accordance with the Sheindorf-Rebuhn-Sheintuch model.

Keywords: Acid Dye, Adsorption, Adsorption Isotherms, Adsorption Rate, Aqueous-Solution, Basic Dyes, Basic Green 4, Basic Yellow 28, Bromide, Ci Basic Green 4, Clay, Clays, Competitive Adsorption, Competitive Adsorption, Data, Dye, Dye Adsorption, Dyes, Equilibrium, Freundlich, Granular Inorganic-Organic Pillared Clays, Granulation, Granule, High-Shear Wet Granulation, Isotherms, Kinetic, Kinetics, Langmuir, Langmuir Isotherm, Langmuir Model, Malachite Green, Model, Models, Montmorillonite, Non-Linear Regression, Nonlinear Regression, pH, Phenol, Pillared Clay, Pillared Clays, Pseudo First Order, Pseudo-First-Order, Regression, Removal, Sheindorf-Rebuhn-Sheintuch Model, Size, Sorbents, Sorption, Systems, Textile Dyes

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Full Text: [2010\Env Tec31, 1045.pdf](2010/Env%20Tec31,%201045.pdf)

Abstract: Ralstonia pickettii isolated from copper-contaminated lake sediment are adapted to high levels of copper after 100 years of selective pressure. Two R. pickettii strains (12D and 12J) were selected for the studies reported herein due to their distinct differences in genomic structure, different metal resistance patterns and carriage of a filamentous phage. Copper sequestration studies revealed that these strains could bind up to 27.44 (12D) and 38.19 (12J) mg copper per g dry weight of cells and that viable cells sequestered more copper than heat-killed cells. Viable cells and heat-killed cells had significantly different saturation binding curves, indicating that one or more unique copper sequestration mechanism(s) was involved in binding by viable cells. Electron microscopy showed alteration of cell outer envelope after cells were grown in the presence of copper, suggesting that the accumulation of copper was membrane associated. X-ray Absorption Near Edge Structure and Extended X-ray Absorption Fine Structure revealed that the copper sequestered was present as Cu(II) and bound to oxygen and/or nitrogen. Recent completion of the genome sequence revealed that an approximately 220 kb region was enriched with metal resistance and transporter genes found in multiple copies. Comparative sequence analysis revealed that several genes may have been derived from horizontal transfer. Hence, rapid adaptation of R. pickettii to high concentrations of metal appears due to robust gene duplication and importation of several types of resistance determinants.

Keywords: Alcaligenes-Eutrophus CH34, Aqueous-Solutions, Bioaccumulation, Biosorption, Biosorption, Copper, Copper Resistance, *Cupriavidus-metallidurans*, Equilibrium, Extremophile, Genomics, Heavy-Metals, Removal, Resistance, *Saccharomyces-cerevisiae*, Toxic Metals

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Full Text: [2010\Env Tec31, 1203.pdf](2010/Env%20Tec31,%201203.pdf)

Abstract: In this study, we investigated the application of sludge waste obtained from a coal mine drainage treatment facility that treats acid mine drainage (designated as AMD) from metal-mine water. The coal mine drainage sludge (designated as CMDS), which contained 70% goethite and 30% calcite, was utilized as a sorption material for Cu(II) and Zn(II) removal from an aqueous solution of metallic mine drainage. The equilibriums and kinetics were investigated during a series of batch adsorption experiments. The Langmuir model was used to fit the equilibrium data, resulting in the best fits. The removal efficiencies were controlled by solution pH, temperature, initial concentration of heavy metal, sorbent amount and contact time. The pseudo-second-order kinetic model was used to fit the kinetic data, providing a good correlation with the experimental data. The results of a thermodynamic study showed that the activation energies (E-A) were 3.75 and 1.75 kJ mol-1 for the adsorption of Cu(II) and Zn(II) on to CMDS at pH 5.5. These values of activation energy could correspond to physisorption. The positive values obtained for both the standard enthalpy change, Δ(0), and the standard entropy change, ΔS-0, suggest that the adsorption of Cu(II) and Zn(II) on to the CMDS was an endothermic reaction and that randomness increased at the solid-liquid interface during the adsorption of Cu(II) and Zn(II) on to the CMDS. The adsorption process also followed a pseudo-second-order kinetic model.

Keywords: Acid Mine Drainage, Activation, Activation Energy, Adsorbent, Adsorption, Adsorption Isotherms, Application, Aqueous Solution, Aqueous-Solutions, Batch, Batch Adsorption, Calcite, Coal, Coal Mine Drainage Sludge, Concentration, Copper(II), Correlation, Cu(II), Data, Drainage, Endothermic, Energy, Enthalpy, Entropy, Equilibrium, Experimental, Experiments, Goethite, Heavy Metal, Heavy Metals, Interface, Ions, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir Model, Metal, Metals, Mine Drainage, Model, Pb(II), pH, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Randomness, Removal, Sludge, Solution, Sorbent, Sorption, Standard, Temperature, Thermodynamic, Thermodynamic Studies, Thermodynamics, Treatment, Waste, Water, Zn(II)

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Full Text: [2010\Env Tec31, 1221.pdf](2010/Env%20Tec31,%201221.pdf)

Abstract: The potential of Eichhornia crassipes biomass for the adsorption of three metal ions, Pb(II), Cd(II) and Zn(II), from aqueous solution was studied using five two-parameter adsorption isotherm equations - Langmuir, Freundlich, Flory-Huggins, Temkin and Redlich-Peterson isotherms. The equilibrium adsorption data were obtained at different initial metal ion concentrations (Co = 10-60 mg/L), 3 h contact time, 30 degrees C temperature, a dosage of 2 g/L, agitation rate of 150 rpm and buffered at pH 4.84. Langmuir isotherms gave monolayer sorption capacities (qm) of 26.32, 12.60 and 12.55 mg/g for Pb(II), Cd(II) and Zn(II) metal ions, respectively. The same trend of metal uptake was indicated by plots of sorption favourability (SF). Negative values of [image omitted] indicated that the adsorption was spontaneous and exothermic in nature, and values from the Temkin isotherm constant, bT, suggested a mechanism consistent with an ion-exchange process. The results from these studies indicated that E. crassipes biomass has promising potential for the removal of toxic metals from aquatic environments.

Keywords: Adsorption, Adsorption Capacity, Adsorption Isotherm, Agitation, Aqueous Solution, Aqueous-Solutions, Biomass, Biosorption, Cadmium, Cd(II), Co, Data, Eichhornia Crassipes, Equilibrium, Exothermic, Freundlich, Ion Exchange, Ion-Exchange, Ionexchange, Ions, Isotherm, Isotherm Equations, Isotherms, Langmuir, Langmuir Isotherms, Mechanism, Metal, Metal Ions, Metal Uptake, Metal-Ions, Metals, Monolayer, Pb(II), pH, Potential, Redlich-Peterson, Removal, Solution, Sorption, Sorption, Temkin, Temkin Isotherm, Temperature, Toxic, Toxic Metals, Trend, Uptake, Wastes, Water, Water Hyacinth, Water-Hyacinth, Weed, Zinc, Zn(II)

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Full Text: [2010\Env Tec31, 1623.pdf](2010/Env%20Tec31,%201623.pdf)

Abstract: In this study, the removal of nickel ions from aqueous solutions using iron oxide and manganese oxide coated sand (ICS and MCS) under different experimental conditions was investigated. The effect of metal concentration, contact time, solution pH and temperature on the amount of Ni(II) sorbed was studied and discussed. Langmuir and Freundlich isotherm constants and correlation coefficients for the present systems at different temperatures were calculated and compared. The equilibrium process was well described by the Langmuir isotherm model: the maximum sorption capacities (at 29 K) were 2.73 mg Ni/g and 3.33 mg Ni/g of sorbent for ICS and MCS, respectively. Isotherms were also used to evaluate the thermodynamic parameters (G degrees, H degrees, S degrees) of adsorption. The sorption kinetics were tested for the pseudo-first-order, pseudo-second-order and intra-particle diffusion models. Good correlation coefficients were obtained for the pseudo-second-order kinetic model, showing that the nickel uptake process followed the pseudo-second-order rate expression.

Keywords: Adsorption, Aqueous Solutions, Bentonite, Biosorption, Contact Time, Copper, Desorption, Diffusion, Equilibrium, Freundlich, Freundlich Isotherm, Heavy-Metals, Intra Particle Diffusion, Intra-Particle Diffusion, Intraparticle Diffusion, Ions, Iron, Isotherm, Isotherms, Kinetic, Kinetic Model, Kinetics, Langmuir, Langmuir And Freundlich Isotherm, Langmuir Isotherm, Manganese, Metallic Oxide Coated Sand, Model, Models, Ni(II), Nickel, Nickel Removal, Oxide, Pb, pH, Phosphorus, Process, Pseudo Second Order, Pseudo-Second-Order, Removal, Retention, Sand, Sorbent, Sorption, Sorption Kinetics, Temperature, Thermodynamic, Thermodynamic Parameters, Uptake, Water

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Full Text: [2011\Env Tec32, 145.pdf](2011/Env%20Tec32,%20145.pdf)

Abstract: To study the adsorptive separation efficiency, adsorption and desorption performances of diethyl phthalate (DEP) were investigated with a functional polymer resin (NDA-702). A macroporous polymer resin (XAD-4) and a coal-based granular activated carbon (AC-750) were chosen for comparison. The kinetic adsorption data obeyed the pseudo-second-order rate model, and the adsorption processes were limited by both film and intraparticle diffusions. Adsorption equilibrium data were well fitted by the Freundlich equation, and the larger uptake and higher selection of NDA-702 than AC-750 and XAD-4 was probably due to the microporous structure, phenyl rings and polar groups on NDA-702. Thermodynamic adsorption studies indicated that the test adsorbents spontaneously adsorbed DEP, driven mainly by enthalpy change. Continuous fixed-bed runs demonstrated that there no significant loss of the resin’s adsorption capacity and there was complete regeneration of NDA-702. The results suggest that NDA-702 has excellent potential as an adsorption material for water treatment.

Keywords: Acid Esters, Activated Carbon, Adsorbents, Adsorption, Cross-Linked Polymer, Cyclodextrin, Degradation, Diethyl Phthalate, Equilibrium, Freundlich, Kinetic, Plasticizers, Removal, Resin, Separation, Solubility, Sorption, Thermodynamic, Waste-Water

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Full Text: [2011\Env Tec32, 325.pdf](2011/Env%20Tec32,%20325.pdf)

Abstract: This study examined the sorption behaviour of Pb(II) and C.I. Acid Yellow 44 on Posidonia oceanica, an abundant Mediterranean biomass. A comparison with sorption onto cellulose extracted from the raw material was carried out to identify those site characteristics that play a predominant role in the adsorption of both dye and metal ions. Kinetic and equilibrium studies were performed for single and binary component systems, and the experimental data were analyzed by a non-linear method. The pseudo second-order kinetic model was successfully applied for both dye and metal retention onto sorbents in single and binary systems. Both sorbents were found to be more effective for lead than for Yellow 44 removal. However, lead sorption was more effective on raw P. oceanica suggesting that the metal ions are sorbed into the whole available biomass sites (cellulose and lignin). An opposite behaviour was reported for Yellow 44 sorption, which was found to be more effective on the extracted cellulose than raw P. oceanica. This finding proves that the only available sites for dye sorption are the cellulosic ones. The binary component experimental studies indicated competition between dye and lead for the available sites of raw *P. oceanica*. However, this competition was found to be less prevalent for sorption by cellulose extracted from raw P. oceanica suggesting that, in binary component systems, the cellulosic sites are equally available for both pollutants, the only limiting parameter being the size of the molecular sorbate. Langmuir and Freundlich isotherms were used to fit the experimental data using the non-linear method for parameter determination.

Keywords: Adsorption, Aqueous-Solutions, Basic Dye, Cellulose, Dye, Equilibrium, Freundlich, Heavy-Metals, Isotherms, Kinetic, Kinetic Model, Kinetic-Model, Kinetics, L.Fibers, Langmuir, Low-Cost Adsorbents, Metal-Complexed Dye, Nonlinear, Nonlinear Methods, Pb(II), Pollutant, Posidonia Oceanica, Removal, Sorption

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Full Text: [2011\Env Tec32, 363.pdf](2011/Env%20Tec32,%20363.pdf)

Abstract: The purpose of this work was to study the synthesis of pillared interlayered clays from Moroccan stevensite called locally ‘Ghassoul’. This clay has been intercalated with cetyltrimethylammonium surfactant (CTA-Stv) and aluminium hydroxypolycation (Al13-Stv). Characterization studies were performed using XRF, XRD, FTIR and DTA/TG analysis. Basal spacing values of Al13-Stv and CTA-Stv increased respectively from 13.5 angstrom for natural stevensite to 17.5 and 17.6 angstrom with increasing Al137+/clay and CTA+/clay ratios. The DTA/TG results showed that Al13-Stv has a relatively high thermal stability compared with CTA-Stv. A quasi-irreversible intercalation by exchanging the interlayer inorganic cations with voluminous pillars Al137+ or CTA+ was observed. Batch adsorption of chromate anions from aqueous solutions was investigated and the results showed that both pillared clays had great affinity for the chromate compared with untreated stevensite. The Dubinin-Kaganer-Radushkevich (DKR) model was selected to describe the adsorption isotherms. The maximum adsorption capacities for natural stevensite, Al13-Stv and CTA-Stv are 13.7, 75.4 and 195.6 mmol/kg, respectively.

Keywords: Adsorption, Anionic Contaminants, Aqueous-Solutions, Batch, Batch Adsorption, Bentonite, Catalysts, Characterization, Chromate, Equilibrium, FTIR, Isotherms, Metal-Ions, Montmorillonite, Moroccan Stevensite, Pillared Clay, Smectites, Sorption, Surfactant-Modified Clay

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Full Text: [2011\Env Tec32, 447.pdf](2011/Env%20Tec32,%20447.pdf)

Abstract: A new organoclay, consisting of montmorillonite modified by a hexadecyl trimethyl ammonium (HDTMA) microemulsion, was synthesized, characterized and used as an adsorbent for the removal of o-nitrobenzoic acid from aqueous solution. Adsorption kinetics, isotherms and effects of operating variables, such as adsorbent dosage, ionic strength and initial solution pH, were also investigated. The results of Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD) analysis and BET surface area determination indicated that HDTMA molecules had entered into the interlayer of the montmorillonite. The optimized experimental conditions for the adsorption of *o*-nitrobenzoic acid by montmorillonite modified by HDTMA microemulsion were 0.5 g adsorbent dosage, 0.4 mL of 0.1 mol center dot lbL-1 CaCl2 solution, initial solution pH of 6.0 and contact time of 6 h. The adsorption isotherms of o-nitrobenzoic acid fitted the Langmuir model well (R2 = 0.9880). The adsorption kinetics data fitted the pseudo-second-order equation (R2 = 0.9999). These above results indicate that montmorillonite modified by an HDTMA microemulsion can be used as adsorbent for o-nitrobenzoic acid because of its high adsorption capacity and low cost.

Keywords: Adsorption, Adsorption Kinetics, Ammonium, Aqueous-Solution, Bentonites, Charge-Densities, Clay, FTIR, Isotherms, Kinetics, Langmuir, Microemulsion, O-Nitrobenzoic Acid, Organic Contaminants, Organo-Montmorillonite, *p*-Nitrophenol, pH, Phenol, Removal, Sorption, Surfactant, Water

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Full Text: [2011\Env Tec32, 455.pdf](2011/Env%20Tec32,%20455.pdf)

Abstract: The sorption equilibrium and kinetics of Sunset Yellow dye in aqueous solutions on the weak base anion exchange resin Amberlite FPA51 were examined in this paper. The influences of phase contact time, solution pH, initial dye concentration and temperature were studied by the batch method. The amounts of dye sorbed at equilibrium changed from 9.9 to 48.7 mg/g with increasing initial dye concentration in the range 100-500 mg/L. The experimental data were analysed by the Langmuir, Freundlich, Temkin and Dubinin-Radushkevich models of adsorption. The maximum monolayer capacity was 130.6 mg/g. The sorption free energy was equal to 14.6 kJ/mol and revealed the nature of the ion exchange mechanism in this system. The kinetic data were modelled using the pseudo-first-order, pseudo-second-order (types 1-5) and intraparticle diffusion equations. The experimental data were well described by types 1-3 of the pseudo-second-order kinetic model.

Keywords: Activated Carbon, Adsorption, Anion Exchanger, Aqueous-Solutions, Dye, Equilibrium, Freundlich, Ion Exchange, Kinetic, Kinetic Model, Kinetics, Langmuir, Malachite-Green, Mechanism, Methylene-Blue, pH, Reactive Dyes, Removal, Resin, Sorption, Sunset Yellow, Tartrazine, Textile Wastewaters

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Full Text: [2011\Env Tec32, 523.pdf](2011/Env%20Tec32,%20523.pdf)

Abstract: A series of novel granular chitosan-g-poly(acrylic acid)/attapulgite/sodium humate (CTS-g-PAA/APT/SH) composite hydrogels were successfully prepared by one-step free radical graft polymerization and applied as adsorbents for the removal of Pb(II) from aqueous solution. The effects of adsorbent composition (including the contents of APT, SH and CTS) on adsorption capacity and adsorption rate were investigated in detail. Results from kinetic experiments showed that the rate of Pb(II) adsorption on the composite hydrogels was quite fast, that more than 90% of the equilibrium adsorption capacity occurs within two minutes and that the adsorption equilibrium could be achieved within 10 minutes. The adsorption kinetics fit well with the pseudo-second order equation. The introduced SH is helpful for both adsorption capacity and adsorption rate. The -COOH and -COO- of PAA, -NH2 of CTS, Ph-O- and -COO- of SH, as well as cation exchange and Si-OH of APT, participate in adsorption of Pb(II). The synergistic effect of these groups is responsible for the high adsorption capacity and rate.

Keywords: Adsorption, Adsorption, Adsorption Kinetics, Aqueous Solution, Attapulgite, Attapulgite, Cd(II), Composite, Composite Hydrogels, Cross-Linked Chitosan, Cu(II), Equilibrium, Heavy-Metal Ions, Kinetic, Kinetics, Methylene-Blue, Palygorskite, Pb(II), Removal, Sodium Humate, Superabsorbent Composites, Water

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Full Text: [2011\Env Tec32, 569.pdf](2011/Env%20Tec32,%20569.pdf)

Abstract: The performance of polystyrene anion exchangers in purifying wastewaters containing metatartaric acid and heavy metal ions (especially those from electroless plating processes) was investigated. The following anion exchangers were selected: Lewatit MonoPlus M 500, Lewatit MonoPlus MP 64, Lewatit MP 62 and Amberlite IRA 402. A batch method was used to study the influence of: phase contact time (1-120 min); solution pH (2-9); concentration of initial heavy metal Cu(II), Zn(II), Co(II) and Ni(II) complexes (1.25 x 10-4 M to 8.0 x 10-3 M); temperature (303-333K); and interfering ions (Cl-, NO3-, SO42-, Ca2+, Mg2+). The amounts of Cu(II), Zn(II), Co(II) and Ni(II) complexes with metatartaric acid sorbed at equilibrium using the strongly basic anion exchanger Lewatit MonoPlus M 500 were equal to 7.25 mg/g, 3.21 mg/g, 3.78 mg/g and 3.98 mg/g, respectively. The equilibrium sorption capacity increased slightly with increasing temperature. The optimal pH sorption was found to be 6.5. The experimental data were analysed using the Langmuir and Freundlich models. The maximum adsorption capacities q0 determined from the Langmuir adsorption equation equal to 7.53 mg/g, 3.75 mg/g, 3.55 mg/g and 4.60 mg/g were in good agreement with the experimental values for Lewatit MonoPlus M 500. The kinetic data obtained at different concentrations were modelled using pseudo first order, pseudo second order and intraparticle diffusion equations. The experimental data were well described by the pseudo second order kinetic model.

Keywords: Adsorption, Anion Exchanger, Aqueous-Solution, Batch Method, Copper, Cu(II), Diffusion, Heavy Metals, Ion-Exchange, Ions, Kinetic-Models, Metatartaric Acid, Model, Plating Bath, Polystyrene Anion Exchangers, Pseudo-First-Order, Pseudo-Second-Order, Purification, Regeneration Applying Electrolysis, Removal, Sorption, Systems, Tartaric Acid

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Full Text: [2011\Env Tec32, 739.pdf](2011/Env%20Tec32,%20739.pdf)

Abstract: Research on chemical modification of pineapple peel fibre with succinic anhydride was carried out to create a novel adsorbent for Cu2+, Cd2+ and Pb2+ removal from aqueous solution. After pretreatment with iso-propyl alcohol and NaOH, pineapple peel fibre was modified via reaction with succinic anhydride for introduction of carboxylic functional groups. The modified pineapple peel fibre was characterized with Fourier transform infrared (FTIR) spectroscopy and evaluated for its adsorptive ability for Cu2+, Cd2+ and Pb2+ from synthetic metal solutions. The FTIR analysis proved the introduction of carboxylic functional groups in the backbone of the modified pineapple peel fibre. The modified pineapple peel fibre showed higher adsorptive capacity for Cu2+, Cd2+ and Pb2+ compared with raw pineapple peel and pineapple peel fibre pretreated with iso-propyl alcohol. The adsorption of Cu2+, Cd2+ and Pb2+ on the modified pineapple peel fibre depended on solution pH value, adsorption time and initial metal concentration. The maximum adsorption capacities of the modified fibre were observed at pH 5.4 for Cu2+ (27.68 +/- 0.83 mg g-1 or 0.44 mmol g-1), at pH 7.5 for Cd2+ (34.18 +/- 1.02 mg g-1 or 0.30 mmol g-1) and at pH 5.6 for Pb2+ (70.29 +/- 2.11 mg g-1 or 0.34 mmol g-1) respectively. The adsorption followed the pseudo-second-order kinetics model and the experimental data coincided well with the Langmuir model.

Keywords: Adsorption, Adsorption, Agricultural Waste, Alcohol, Cd(II), Cu(II), Heavy-Metals, Ions, Kinetics, Metal Ion, Model, Modification, Pb(II), Pineapple Peel Fibre, Pseudo-Second-Order, Research, Rice Husk, Single Metal Solutions, Succinylation, Sugarcane Bagasse

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Full Text: [2011\Env Tec32, 805.pdf](2011/Env%20Tec32,%20805.pdf)

Abstract: The paper presents experimental results and their evaluation for the sorption of copper(II), zinc(II), cobalt(II) and nickel(II) complexes with metatartaric acid on chelating ion exchangers with different functional groups. The literature lacks the data concerning sorption of heavy metal ions in the presence of metatartaric acid on ion exchangers. The effect of important parameters such as the value of pH, the metal(II) ion and ligand concentration as well as their molar ratio and the type of functional group of the ion exchanger used was studied. It was found that the time of 60 min was sufficient for sorption to attain equilibrium. The equilibrium sorption capacities for copper(II), zinc(II), cobalt(II) and nickel(II) complexes with metatartaric acid were 37.35 mg/g, 32.02 mg/g, 32.78 mg/g and 28.31 mg/g on Lewatit TP 207 and 42.15 mg/g, 34.32 mg/g, 27.76 mg/g and 21.70 mg/g on Lewatit TP 260, respectively. The sorption optimum pH was 7. Temperature does not affect the sorption process significantly. The sorption data were well fitted by the Langmuir adsorption model whereas kinetics of the sorption process was well described by the pseudo second order kinetics equation.

Keywords: Adsorption, Aqueous-Solutions, Chelating Ion Exchangers, Distribution Coefficients, Equilibria, Evaluation, Extraction, Heavy Metals, Ions, Kinetics, Literature, Metatartaric Acid, Model, Octylamine, Prediction, Pseudo-Second-Order, Sorption, Tartaric Acid, Waste-Waters

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Full Text: [2011\Env Tec32, 1183.pdf](2011/Env%20Tec32,%201183.pdf)

Abstract: Red mud, an industrial by-product generated during the processing of bauxite ore, was investigated as an inexpensive and effective adsorbent for the adsorption of methylene blue from aqueous solution. Chemical and heat treatments were applied to the raw red mud. The effects of contact time, adsorbent amount, pH, temperature and initial dye concentration were investigated. The adsorption isotherm and kinetics of the raw and activated red mud were studied. Freundlich, Temkin and Dubinin-Radushkevich isotherms were obtained using concentrations of methylene blue ranging from 10 to 70 mg/L. The results indicated that the Dubinin-Radushkevich model provides the best correlation of the experimental data. The adsorption rate data were analysed according to the pseudo-first order kinetic, pseudo-second order kinetic, intraparticle diffusion kinetic and Elovich kinetic models. The pseudo-second order kinetic was the best fit kinetic model for the experimental data.

Keywords: Acid, Activation, Adsorbent, Adsorption, Aqueous-Solution, Batch, Congo Red, Fly-Ash, Ions Removal, Isotherm, Kinetics, Methylene Blue, Methylene-Blue Dye, pH, Red Mud, Zeolite

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Full Text: Env Tec Let8, 225.pdf

Keywords: England, Publication, Publications, Treatment

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Keywords: Coal, Dye, England, Publication, Publications, Removal

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# Title: Environmental Toxicology

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Water Resources: Impact Factor 1.088, 7/47 (2000), Impact Factor 1.062, / (2001)

Espigares, M., Garcia, F., Fernández-Crehuet, M., Álvarez, A. and Gálvez, R. (1999), Detection of hepatitis a virus in wastewater. *Environmental Toxicology*, **14** (4), 391-396.

Full Text: [E\Env Tox14, 391.pdf](E/Env%20Tox14,%20391.pdf)

Abstract: The present study investigates the presence of hepatitis A virus (HAV) in wastewater both before and after conventional treatment. Two different procedures are used to concentrate the viruses: by precipitation and by filtration. The reverse transciptase-polymerase chain reaction (RT-PCR) followed by hybridization are applied to detect HAV. The flocculation of 1 L of wastewater using the aluminum hydroxide adsorption-precipitation method gave two negative samples out of the nine processed, that is, 22% of the samples were HAV negative. The filtration method, using an immersible CX-30 ultrafiltration unit, showed 10% of the samples to be negative. However, the Chi (2) test gave no statistically significant differences for these results with respect to the method of concentration used. All of the samples of raw wastewater were HAV positive, a finding which reflects a high prevalence among the population. Furthermore, although conventional wastewater treatment reduces all other microbiological indicators by more than 99%, HAV was found to remain positive in our samples of treated water. This means that when primary influents are contaminated with HAV, the secondary effluent may constitute a public health hazard in the transmission of HAV. (C) 1999 by John Wiley & Sons, Inc.

Keywords: Polymerase Chain-Reaction, A Virus, Environmental-Samples, Reverse Transcription, PCR Amplification, Polluted Waters, Seminested PCR, Enteroviruses, Rotavirus, RNA, HAV, Wastewater, Hepatitis A, Virus, Water Microbiology, Total Coliforms, Fecal Coliforms, Fecal Streptococci, PCR, Virus Concentration, Reverse Transcriptase

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Full Text: [2002\Env Tox17, 386.pdf](2002/Env%20Tox17,%20386.pdf)

Abstract: To assess the elimination potential of slow sand filters for cyanobacterial hepatotoxins (microcystins), two full-scale experiments were conducted using the German Federal Environment Agency’s experimental field in Berlin, Germany. One experiment was carried out with dissolved microcystins extracted from a cyanobacterial bloom on one of Berlin’s lakes, dosed as short-term, single-pulse application. The other experiment simulated natural conditions more closely, with a longer-term exposure of the filter to living cyanobacterial cells (collected from the same lake) so that most toxins were initially contained inside the cells. The microcystins were detected by ELISA and HPLC/photodiode array detector and subsequently identified by MALDI-TOF MS. The experiment with dissolved microcystins yielded very high elimination rates (>95%) inside the filter bed attributed to biodegradation, whereas retardation by adsorption was low. The obtained half-lives for the microcystins detected by ELISA were about 1 h. The second experiment, which was with mostly cell-bound microcystins, showed similar results during the first days after application of cyanobacteria (elimination >85%). As the population declined in late autumn, the proportion of extracellular to cell-bound microcystins increased. At the same time the elimination rates declined to values <60%. This decline is most likely attributable to retarded biodegradation at temperatures of <4degreesC. Altogether the results of the experiments show that under moderate temperatures, with an intact schmutzdecke (biofilm) with previous contact with microcystins, slow sand filtration is an effective treatment for eliminating microcystins from drinking water. (C) 2002 Wiley Periodicals. Inc.

Keywords: Cyanobacteria, Microcystin, Slow Sand Filtration, Elimination Potential, Elisa, HPLC, Waters, Lake

# Title: Environmental Toxicology and Chemistry

Full Journal Title: [Environmental Toxicology and Chemistry](http://www.setacjournals.org/perlserv/?request=get-archive&issn=1552-8618&volume=16); [Environmental Toxicology and Chemistry](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=07307268); [Environmental Toxicology and Chemistry](http://www3.interscience.wiley.com/journal/122563640/toc)

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Environmental Sciences: Impact Factor 2.462, 6/126 (1999), Impact Factor 2.091, 10/127 (2000)

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Full Text: [1987\Env Tox Che6, 911.pdf](1987/Env%20Tox%20Che6,%20911.pdf)

Abstract: The reductive transformation of azobenzene and selected derivatives was investigated in anaerobic sediment/water systems. The azo compounds exhibited pseudo-first-order disappearance kinetics through at least three half-lives. The reduction kinetics of these compounds was studied as a function of their reduction potential and sediment/water distribution coefficient. There was no apparent correlation between the observed disappearance rate constant and reduction potential. In general, as the distribution coefficient increased, the rate of reduction decreased. Values for the pseudo-first-order rate constant for disappearance ranged from 5.11×10-3 min-1 for methyl red to 6.03×10-6 min-1 for 4,4’-dichloroazobenzene. Removal of the solid phase from the sediment/water samples gave a filtrate with little or no reactivity. Chemical sterilization of the sediment/water sample with formaldehyde and treatment with m-cresol, a dehydrogenase inhibitor, or sodium azide, a metabolic inhibitor, had little effect on the observed reduction rate constants for azobenzene, indicating an abiotic reduction process. Heat sterilization indicated that the reducing agent was heat labile. In studies with 4,4’-dimethoxyazobenzene, the observed rate constant for reduction increased with increasing sediment concentration. Based on the results of these studies, a model for the reduction process was developed that incorporates a nonreactive sorptive sink and a reactive site, both of which are associated with the sediment.

Keywords: Azobenzene, Reduction, Anaerobic, Sediment, Kinetics

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Full Text: [1991\Env Tox Che10, 1511.pdf](1991/Env%20Tox%20Che10,%201511.pdf)

Abstract: The hazard assessment of pulp and paper effluents in the aquatic environment is a complex task. Hundreds of individual compounds in pulping effluents and site-specific differences in processes, effluent treatment, and receiving ecosystems hinder hazard assessment. As a result, it is difficult to relate environmental effects with specific contaminants. Conventional parameters such as organic and nutrient loadings, solids deposition, and color complicate efforts to define chemical toxicants by causing environmental impacts at community and population levels. Reproduction is the most sensitive, consistent, and relevant end point tested to date in the laboratory, in mesocosms and experimental streams, and in field situations near some pulping discharges. Despite the application of a wide range of within-organism measurements, only the induction of mixed-function oxidase activities has been associated with exposure to particular effluent compounds in field situations. No complete mechanism of toxic action has been demonstrated that connects contaminant exposure, within-organism responses, whole-organism effects, and effects at the population and the community levels. Hazard assessments of pulping effluents require multidisciplinary efforts that integrate chemical, toxicological, and biological data at several organizational levels. Tiered or stepwise assessments are recommended that first clarify what adverse effects have occurred and then attempt to identify the responsible contaminants.

Keywords: Assessment, Baltic Coastal Fish, Bass Morone-Saxatilis, Bleach Plant Effluents, Community, Deposition, Environment, Environmental, Experimental, Exposure, First, Hazard Assessment, Kraft Mill Effluent, Loch-Eil-Project, Mass Chlorinated Matter, Mechanism, Multidisciplinary, Organochlorines, Paper, Perca-Fluviatilis L, Population, Pulp, Scup Stenotomus-Chrysops, Treatment, Trout Salmo-Gairdneri, Xenobiotic Biotransformation Enzymes

Notes: highly cited

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Full Text: Env Tox Che10, 1541.pdf

Abstract: The purpose of this review paper is to present the technical basis for establishing sediment quality criteria using equilibrium partitioning (EqP). Equilibrium partitioning is chosen because it addresses the two principal technical issues that must be resolved: the varying bioavailability of chemicals in sediments and the choice of the appropriate biological effects concentration. The data that are used to examine the question of varying bioavailability across sediments are from toxicity and bioaccumulation experiments utilizing the same chemical and test organism but different sediments. It has been found that if the different sediments in each experiment are compared, there is essentially no relationship between sediment chemical concentrations on a dry weight basis and biological effects. However, if the chemical concentrations in the pore water of the sediment are used (for chemicals that are not highly hydrophobic) or if the sediment chemical concentrations on an organic carbon basis are used, then the biological effects occur at similar concentrations (within a factor of two) for the different sediments. In addition, the effects concentrations are the same as, or they can be predicted from, the effects concentration determined in water-only exposures. The EqP methodology rationalizes these results by assuming that the partitioning of the chemical between sediment organic carbon and pore water is at equilibrium. In each of these phases, the fugacity or activity of the chemical is the same at equilibrium. As a consequence, it is assumed that the organism receives an equivalent exposure from a water-only exposure or from any equilibrated phase; either from pore water via respiration; from sediment carbon via ingestion; or from a mixture of the routes. Thus, the pathway of exposure is not significant. The biological effect is produced by the chemical activity of the single phase or the equilibrated system. Sediment quality criteria for nonionic organic chemicals are based on the chemical concentration in sediment organic carbon. For highly hydrophobic chemicals this is necessary because the pore water concentration is, for those chemicals, no longer a good estimate of the chemical activity. The pore water concentration is the sum of the free chemical concentration, which is bioavailable and represents the chemical activity, and the concentration of chemical complexed to dissolved organic carbon, which, as the data presented below illustrate, is not bioavailable. Using the chemical concentration in sediment organic carbon eliminates this ambiguity. Sediment quality criteria also require that a chemical concentration be chosen that is sufficiently protective of benthic organisms. The final chronic value (FCV) from the U.S. Environmental Protection Agency (EPA) water quality criteria is proposed. An analysis of the data compiled in the water quality criteria documents demonstrates that benthic species, defined as either epibenthic or infaunal species, have a similar sensitivity to water column species. This is the case if the most sensitive species are compared and if all species are compared. The results of benthic colonization experiments also support the use of the FCV. Equilibrium partitioning cannot remove all the variation in the experimentally observed sediment-effects concentration and the concentration predicted from water-only exposures. A variation of approximately a factor of two to three remains. Hence, it is recognized that a quantification of this uncertainty should accompany the sediment quality criteria. The derivation of sediment quality criteria requires the octanol/water partition coefficient of the chemical. It should be measured with modern “experimental techniques, which appear to remove the large variation in reported values. The derivation of the final chronic value should also be updated to include the most recent toxicological information.

Keywords: Amphipod Pontoporeia-Hoyi, Aquatic Systems, Bioavailability, Carbon, Coefficients, Equilibrium, Equilibrium Partitioning, Hydrocarbons, Hydrophobic Pollutants, Organic Carbon Normalization, Particle Concentration, Partitioning, Program, Review, SCI, Sediment, Sediment Quality Criteria, Sediments, Sorption, Species, System, Techniques, Toxicity, Uncertainty, USA, Water, Water Quality

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Full Text: [1992\Env Tox Che11, 721.pdf](1992/Env%20Tox%20Che11,%20721.pdf)

Abstract: The high usage of pesticides in the subtropical climate of Florida presents a worst-case scenario under which registrations that may impact public health and the environment must be judged. A methodology is presented that utilizes chemical environmental fate factors in conjunction with chronic toxicity parameters to better assess new active ingredients that are submitted for registration. A ranking index related to leaching potential is assigned to a pesticide as a preliminary screening process. If the index falls within a certain numerical range, then a more in-depth analysis of the environmental fate and toxicological data for the pesticide occurs. A decision matrix that incorporates the results of chronic toxicity analysis and computer simulation of leaching behavior is then applied to the pesticide to decide which registration action may be appropriate. This tool has widespread potential for assessing the leaching potential of pesticides to, and the chronic toxicity of pesticides in, ground water.

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Full Text: [1993\Env Tox Che12, 2121.pdf](1993/Env%20Tox%20Che12,%202121.pdf)

Abstract: The degradation of azo dyes by environmental microorganisms, fungi, and helminths is reviewed. Azo dyes are used in a wide variety of products and can be found in the effluent of most sewage treatment facilities. Substantial quantities of these dyes have been deposited in the environment, particularly in streams and rivers. Azo dyes were shown to affect microbial activities and microbial population sizes in the sediments and in the water columns of aquatic habitats. Only a few aerobic bacteria have been found to reduce azo dyes under aerobic conditions, and little is known about the process. A substantial number of anaerobic bacteria capable of azo dye reduction have been reported. The enzyme responsible for azo dye reduction has been partially purified, and characterization of the enzyme is proceeding. The nematode Ascaris lumbricoides and the cestode Moniezia expansa have been reported to reduce azo dyes anaerobically. Recently the fungus Phanerochaete chrysosporium was reported to mineralize azo dyes via a peroxidation-mediated pathway. A possible degradation pathway for the mineralization of azo dyes is proposed and future research needs are discussed.

Keywords: Azo Dyes, Degradation, Azo Reduction, Azo Reductase, Sediment-Water-Systems, Phanerochaete-Chrysosporium, Pseudomonas-Cepacia, Triphenylmethane Dyes, Activated-Sludge, Aromatic-Amines, Reduction, Biodegradation, Streptomyces, Benzidine

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Full Text: [1996\Env Tox Che15, 194.pdf](1996/Env%20Tox%20Che15,%20194.pdf)

Abstract: It is becoming evident that an increasing number of widely used industrial and agricultural chemicals are estrogenic. The biodegradation products of a major group of nonionic surfactants, the alkylphenol polyethoxylates, are one such group. Some of these chemicals are widespread aquatic pollutants, and bioconcentrate in aquatic biota. Exposure of male rainbow trout (Oncorhynchus mykiss) to four different alkylphenolic chemicals caused synthesis of vitellogenin, a process normally dependent on endogenous estrogens, and a concomitant inhibition of testicular growth. The magnitude of these estrogenic effects was dependent on the estrogenic potency of the chemical, the stage of reproductive development of the fish, and the concentration of the chemical in the water. These results support the contention that exposure of wildlife to environmentally persistent estrogenic chemicals can result in deleterious reproductive consequences.

Keywords: Rainbow Trout, Oncorhynchus Mykiss, Alkylphenol, Testicular Growth, Estrogen, Performance Liquid-Chromatography, Beta-Hexachlorocyclohexane Exposure, Salmo-Gairdneri, Nonionic Surfactants, Long-Term, Mass-Spectrometry, Metabolites, Water, Liver, Estradiol-17-Beta

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Full Text: [E\Env Tox Che15, 2187.pdf](E/Env%20Tox%20Che15,%202187.pdf)

Abstract: The partition coefficients and sorption capacities for cadmium, copper, and lead in freshwater sediments are derived from fitting a Langmuir isotherm to data from 14 sediments. The metal activity in the solution phase was measured using specific ion electrodes. The metal sorption due to acid-volatile sulfide was subtracted from the total sorbed metal to produce the metal bound to other sediment phases. Organic carbon normalized isotherms provide a reasonable representation of the metal sorption. Partition coefficients and capacities are calculated for pH = 6, 7, and 8 (for Cd). The organic carbon normalized isotherm parameters for the sediments are compared to those reported for soils and sludges. The comparisons for cadmium exhibit differences for which no ready explanations are available. For copper and lead, however, the differences can be attributed to the use of specific ion electrodes for measuring metal activity in the sediment experiments. The cadmium sediment partition coefficients contribute a small increment to the sediment quality criteria. For copper and lead, however, the additional binding to sediment organic carbon is significant and can amount to 1 to 10 and 10 to 100 µmol/g dry weight for lead and copper, respectively, depending on the organic carbon concentration of the sediment.

Keywords: Sediment Quality Criteria, Langmuir, Cadmium, Copper, Lead, Cadmium Adsorption, Soils, Sorption, Isotherms, Binding, Acid

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Full Text: [1997\Env Tox Che16, 1351.pdf](1997/Env%20Tox%20Che16,%201351.pdf)

Abstract: A technique using Tenax TA (R) beads as “sink” for desorbed solute was employed to measure the kinetics of desorption of chlorobenzenes, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons from laboratory-contaminated sediment. First-order rate constants of rapid and slow desorption were in the order of 10-1/h and 10-3/h, respectively. The rate constants of slow desorption correlate well with the molecular volumes of the compounds used and decrease between 2 and 34 d of equilibration. Slowly desorbing fractions increase with both increasing solute hydrophobicity and increasing equilibration time.

Keywords: Aging, Aliphatic Halocarbons, Chemicals, Chlorobenzenes, Desorption, Desorption Kinetics, Kinetics, Naphthalene, Natural Sediments, Nonequilibrium Sorption, Organic Compounds, Organic-Compounds, Pollutants, Polychlorinated Biphenyls, Polycyclic Aromatic Hydrocarbons, Sediment, Slowly Reversible Sorption, Soil, Solubility, Sorption Coefficients

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Full Text: [1998\Env Tox Che17, 1236.pdf](1998/Env%20Tox%20Che17,%201236.pdf)

Abstract: Organic contaminant exchange kinetics between semipermeable membrane devices (SPMDs) and water were studied in two suspensions of estuarine and marine sediments under conditions of high and low turbulence over a period of 56 d. Prior to exposure, the SPMDs were spiked with a number of exposure standards not occurring in the environment, The release rate of these compounds was used as an independent measure of the exchange kinetics between the SPMD and water. The uptake rates of chlorobenzenes, polychlorinated biphenyls, (PCBs) and polycyclic aromatic hydrocarbons (PAHs) were lower by a factor of three under conditions of low turbulence. For compounds with a log octanol-water partition coefficient (K-ow) > 5.5 the uptake rate was constant during the entire period. Within each compound class, uptake rate constants correlated well with log K-ow, The uptake rate constants of PAHs were lower than those of PCBs and chlorobenzenes by a factor of 10, but these estimates probably are artificially low due to an overestimation of the aqueous PAH concentrations. Release rate constants of the exposure standards fell within the range of the uptake rate constants of chlorobenzenes and PCBs, although with poor precision. Suggestions for improving the measurement of exchange rate constants of exposure standards are presented. The role of triolein in the exchange kinetics is shown to be minor.

Keywords: Air, Chlorobenzenes, Contaminants, Kinetics, Natural Sediments, Organic-Chemicals, Organochlorines, Pollutants, Polychlorinated Biphenyls, Polycyclic Aromatic Hydrocarbons, Polycyclic Aromatic-Hydrocarbons, Sediments, Semipermeable Membrane Devices, Sorption, Spmds, Water, Water Partition-Coefficients

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Full Text: [1998\Env Tox Che17, 2310.pdf](1998/Env%20Tox%20Che17,%202310.pdf)

Abstract: Techniques for reducing ammonia toxicity in freshwater sediments were investigated as part of a project to develop toxicity identification and evaluation (TIE) procedures for whole sediments. Although ammonia is a natural constituent of freshwater sediments, pollution can lead to ammonia concentrations that are toxic to benthic invertebrates, and ammonia can also contribute to the toxicity of sediments that contain more persistent contaminants. We investigated the use of amendments of a natural zeolite mineral, clinoptilolite, to reduce concentrations of ammonia in sediment pore water. Zeolites have been widely used for removal of ammonia in water treatment and in aqueous TIE procedures. The addition of granulated zeolite to ammonia-spiked sediments reduced pore-water ammonia concentrations and reduced ammonia toxicity to invertebrates. Amendments of 20% zeolite (v, v) reduced ammonia concentrations in pore water by greater than or equal to 70% in spiked sediments with ammonia concentrations typical of contaminated freshwater sediments. Zeolite amendments reduced toxicity of ammonia-spiked sediments to three taxa of benthic invertebrates (Hyalella azteca, Lumbriculus variegatus, and Chironomus tentans), despite their widely differing sensitivity to ammonia toxicity. In contrast, zeolite amendments did not reduce acute toxicity of sediments containing high concentrations of cadmium or copper or reduce concentrations of these metals in pore waters. These studies suggest that zeolite amendments, used in conjunction with toxicity tests with sensitive taxa such as H. azteca, may be an effective technique for selective reduction of ammonia toxicity in freshwater sediments.

Keywords: Ammonia, Amphipod Hyalella-Azteca, Benthic Invertebrates, Bioassays, Cadmium, Clinoptilolite, Copper, Hardness, Lead, Macroinvertebrates, Metals, Metals, Natural Zeolite, pH, Quality Criteria, Removal, Sediment Toxicity, Technical Basis, Toxicity Identification, Water, Water Treatment, Zeolite

Cornelissen, G., Rigterink, H., van Noort, P.C.M. and Govers, H.A.J. (2000), Slowly and very slowly desorbing organic compounds in sediments exhibit Langmuir-type sorption. *Environmental Toxicology and Chemistry*, **19** (6), 1532-1539.

Full Text: [E\Env Tox Che19, 1532.pdf](E/Env%20Tox%20Che19,%201532.pdf)

Abstract: Desorption kinetics were determined for 1,2,4-trichlorobenzene (TCB), 1,3-Dichlorobenzene (DCB), and trichloroethylene (TCE) in a sediment at various concentrations. The desorption data were interpreted with a (nonmechanistic) first-order three-compartment model. In this way, separate sorption isotherms could be constructed for rapidly, slowly, and very slowly desorbing sorbate, respectively. Slowly desorbing (rate constant k similar to 10-3/h) and very slowly desorbing (k = 10-4 to 10-5/h) sorbate exhibited nonlinear Langmuir-type sorption, with capacities on the order of 4.6 to 19 and 0.54 to 1.5 mmol/kg organic carbon (OC) and affinity constants of 0.18 to 41 and 32 to 272 L/mmol, respectively. The affinity constants increased with increasing sorbate hydrophobicity. Rapidly desorbing (k = 10-1/h) sorbate showed linear sorption isotherms, with log K-oc (octonol-water partition coefficients) of 1.59±0.12 (TCE), 2.03±0.13 (DCB), and 3.13±0.03 (TCB), respectively. These results confirm the hypothesis that desorption is rapid from linearly sorbing organic matter, whereas it is slow and very slow from nonlinearly sorbing sites. Furthermore, the results also demonstrate the applicability of the desorption kinetic method in terms of experimentally separating an overall Freundlich-like isotherm in linear and nonlinear isotherms.

Keywords: Slow Desorption, Isotherm Nonlinearity, Langmuir Isotherm, Organic Compounds, Distributed Reactivity Model, Polycyclic Aromatic-Hydrocarbons, Polychlorinated-Biphenyls, Desorption-Kinetics, Soils, Chlorobenzenes, Temperature, Adsorption, Extraction, Fractions

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Full Text: [E\Env Tox Che19, 1692.pdf](E/Env%20Tox%20Che19,%201692.pdf)

Abstract: Recently, environmental quality standards (EQSs) that include background concentrations for metals have been set in The Netherlands. These EQSs are based on environmental risk limits and applying the added risk approach. The added risk approach was developed to incorporate the background concentration of naturally occurring substances such as metals in environmental risk limits. The original approach discriminates between the bioavailable and unavailable fraction and calculates a permissible concentration that can be added to a background concentration, i.e., the maximum permissible addition (MPA). This MPA includes the effects caused by the bioavailable fraction of the background concentration. The new EQSs in The Netherlands assume the bioavailable fraction of background metals is mathematically equal to zero. The rationale for this assumption is that, from an environmental policy perspective, background-related effects that in reality do exist, are desirable because they may in theory lead to increased ecosystem variability or biodiversity. Moreover, there is little information on the bioavailability of background concentrations of metals. This paper presents a theoretical exercise in which the effects of varying background bioavailability on MPA values for cadmium, copper, lead, and zinc in water and soil are evaluated. The results shaw that, for these metals, bioavailability does not affect or only slightly affects the MPAs. Only the terrestrial MPAs for copper, lead, and zinc are sensitive to bioavailability. This minor influence of assumed percentage bioavailability on the MPAs, coupled with a policy-driven assumption that effects of background concentrations should be ignored, explain the current policy in The Netherlands that the bioavailability of background concentrations of metals should be assumed to be zero.

Keywords: Soil Quality Criteria, Noec Toxicity Data, Protection Levels, Heavy-Metals, Sensitivity, Metals, Background Concentration, Bioavailability, Risk Limits

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Full Text: [2002\Env Tox Che21, 1766.pdf](2002/Env%20Tox%20Che21,%201766.pdf)

Abstract: Sorption coefficients (K-DOC) on dissolved organic matter (DOM) have been determined by means of solid-phase microextraction (SPME) for hydrophobic organic compounds (HOCs) of various classes, for example, polycyclic aromatic hydrocarbons (PAHs), noncondensed arenes, and alkanes. Relating the K-DOC values obtained to the octanol-water partition coefficients of the solutes results in class-specific correlations. Obviously, PAHs have a higher affinity to DOM than other HOCs with equal K-OW values. The different K-DOC to K-OW correlations can be combined into one general formula based on a modified Flory-Huggins concept. It permits the calculation of sorption coefficients from the solubility parameters (8) and K-OW values of the solutes and the solubility parameter of the sorbent. The latter value, which is specific to the DOM under consideration, can be determined from a single measured sorption coefficient. By applying the proposed Flory-Huggins concept, which is based on the presumption of nonspecific interactions between HOCs and DOM, the different affinities of PAHs, noncondensed arenes, and alkanes to DOM can be accurately predicted.

Keywords: Alkanes, Arenes, Aromatic, Aromatic Hydrocarbons, Chemicals, Coefficients, Concept, Contaminants, Dissolved, Dissolved Humic Substances, Dissolved Organic Matter, Dom, Flory-Huggins Concept, Humic, Humic Substances, Hydrocarbons, Hydrophobic Organic Compounds, Interactions, K-Ow, Matter, Model, Organic, Organic Compounds, Organic Matter, PAHs, Parameters, Partition, Partition Coefficients, Partitioning, Polycyclic Aromatic Hydrocarbons, Qsar, Soil Sorption, Solid Phase Microextraction, Solubility, Solubility Parameters, Sorption, Thermodynamics, Water

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Full Text: [2002\Env Tox Che21, 2412.pdf](2002/Env%20Tox%20Che21,%202412.pdf)

Abstract: The individual and combined effects of copper, cadmium, and zinc on the cell division rate of the tropical freshwater alga Chlorella sp. were determined over 48 to 72 h. Metal mixtures were prepared based on multiples of their single-metal median effective concentration (EC50) values, i.e., toxic units (TU) using a triangular mixture design with five toxicant levels (0, 0.75, 1.0, 1.25, and 1.5 TU). Single-metal EC50 values after a 72-h exposure were 0.11, 0.85, and 1.4 μM for copper, cadmium, and zinc, respectively. Significant interactions were observed for all metal combinations after 48 and 72 h. An equitoxic mixture of Cu + Cd was more than concentration additive (synergistic) to the growth of Chlorella sp., while combinations of Cu + Zn, Cd + Zn, and Cu + Cd + Zn were all less than concentration additive or were antagonistic. To determine the effect of each metal on the uptake of the other, extracellular (membrane-bound) and intracellular metal concentrations, both alone and in mixtures, were compared. The increased growth inhibition observed for mixtures of Cu + Cd was due to higher concentrations of cell-bound and intracellular copper in the presence of cadmium compared with copper alone (i.e., cadmium-enhanced copper uptake). In contrast, both extra- and intracellular cadmium concentrations were reduced in the presence of copper. In mixtures of Cu + Zn, copper also inhibited the binding and cellular uptake of zinc, which resulted in decreased toxicity. Zinc had no appreciable effect on the uptake of copper by Chlorella sp. Our results suggest that all three metals share some common uptake and transport sites on Chlorella cells and that copper out competes both cadmium and zinc for cell binding. Determination of metal cell distribution coefficients (K-d) confirmed that K-d values for cadmium and zinc in single-metal exposures decreased in the presence of copper.

Keywords: Algae, Metal, Toxicity, Synergism, Antagonism, Diatom Nitzschia-Closterium, Marine-Phytoplankton, Ion-Exchange, Growth, Dunaliella, Systems, Zn, Chlamydomonas, Pyrenoidosa, Biosorption

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Full Text: [2003\Env Tox Che22, 450.pdf](2003/Env%20Tox%20Che22,%20450.pdf)

Abstract: Copper (Cu) is bound strongly to clay minerals and organic matter in soils, and forms both insoluble and soluble organic complexes with organic carbon. In this experiment, the effect of five manure composts (biosolid, farmyard manure, spent mushroom, pig manure, and poultry manure) on the adsorption and complexation of Cu in a mineral soil (Manawatu sandy soil, Palmerston North, New Zealand) low in organic matter content was examined. The effect of biosolid on the uptake of Cu from the soil, treated with various levels of Cu (0-400 mg/kg soil), was examined by using mustard (Brassica juncea L.) plants. The redistribution of the added Cu in soil was evaluated by a chemical fractionation scheme. Addition of manure compost increased the adsorption and complexation of Cu by the soil. At the same level of total organic carbon addition, a significant difference was found in the extent of Cu adsorption among the manure-amended soils. However, less difference was found in the amount of Cu complexed among the manure-amended soils. A significant inverse relationship was found between the extent of Cu adsorption and the dissolved organic carbon (DOC) in the manure-amended samples, indicating that DOC formed soluble complexes with Cu. Increasing addition of Cu increased Cu concentration in plants, resulting in decreased plant growth at high levels of Cu (i.e., phytotoxicity). Addition of biosolid was found to be effective in reducing the phytotoxicity of Cu at high levels of Cu addition. Significant relationships were found between dry matter yield and total Cu or free Cu2+ concentration in soil solution. Addition of biosolid decreased the concentration of the soluble and exchangeable Cu fraction but increased the concentration of the organic-bound Cu fraction in soil.

Keywords: Adsorption, Complexation, Copper, Manure, Phytoavailability, Soil Copper, Tissue Concentrations, Agricultural Land, New-Zealand, Zinc, Phytotoxicity, Toxicity, Sludge, Bioavailability, Fractionation

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Full Text: [2003\Env Tox Che22, 2306.pdf](2003/Env%20Tox%20Che22,%202306.pdf)

Abstract: The effect of sorption on benzene biodegradation in sandy soil was studied by conducting kinetic microcosm batch tests in soil-free solution and in the presence or absence of bacteria in soil materials with varying degrees of powdered activated carbon (PAC). In the soil-free experiment, benzene was added to a solution inoculated with Pseudomonas aeruginosa bacteria in order to achieve a potential or maximum biodegradation rate. In subsequent experiments, benzene was applied to a solution containing sandy soil and various PAC contents with and without inoculating P. aeruginosa. Benzene concentrations in the soil-free experiments decreased with time with two characteristic rates. A two-stage exponential decay model adequately represented the observed solution concentration pattern with time. Sorption experiments in bacteria-free soil also decreased monotonically, with the extent of sorption increasing as PAC content increased. The sorption data were represented well with a two-stage irreversible sorption model. A third set of experiments in the presence of both soil and bacteria showed more rapid concentration loss from solution than the set of experiments with bacteria-free soil. A model combining sorption and degradation greatly overestimated the loss when the rate coefficient from the bacteria-free experiments was used. Satisfactory agreement between model predictions and observed values was obtained when the degradation rate coefficients were decreased by factors ranging from 3 to 10, depending on the amount of PAC present. Model predictions of the percentage benzene mass remaining in the soil after 25 d of degradation ranged from 72 to 97%, depending on the PAC content, compared to only 2.5% remaining in soil-free solution.

Keywords: Sorption, Benzene, Bioavailability Factor, Biodegradation, Irreversible Adsorption, P-Xylene, Toluene, Kinetics, Degradation, Naphthalene, Bioavailability, Hydrocarbons, Sediments, Batch

? Guo, X.Y., Zhang, S.Z., Shan, X.Q., Luo, L., Pei, Z.G., Zhu, Y.G., Liu, T., Xie, Y.N. and Gault, A. (2006), Characterization of Pb, Cu, and Cd adsorption on particulate organic matter in soil. *Environmental Toxicology and Chemistry*, **25** (9), 2366-2373.

Full Text: [2006\Env Tox Che25, 2366.pdf](2006/Env%20Tox%20Che25,%202366.pdf)

Abstract: Evidence exists for significant metal enrichment in particulate organic matter (POM) compared to other soil constituents, but the relevant mechanisms are poorly understood. In the present study, adsorption of the heavy metals Pb, Cu, and Cd on a loamy soil and on POM separated from this soil was investigated. The adsorption kinetic data can be well described with a pseudo-second order model, whereas the equilibrium data are well fitted by a Langmuir model. Adsorption isotherms and kinetics data, in addition to the influence of pH on metal adsorption, showed that POM had a much higher adsorption capacity for Pb, Cu, and Cd compared to the whole soil. Ionic strength effects on metal adsorption, Fourier transform infrared spectroscopy, x-ray absorption spectroscopy x-ray absorption spectroscopy including x-ray absorption near-edge structure and extended x-ray absorption fine-structure spectroscopy were employed to elucidate the adsorption mechanisms. The results suggested that Pb and Cu adsorption on POM was mainly through inner-sphere complexes with carboxyl and hydroxyl groups. Cadmium was possibly adsorbed via outer-sphere complexation, indicated by the influence of ionic strength on Cd adsorption.

Keywords: Adsorption, Contamination, Copper, Enrichment, Fourier Transform Infrared Spectroscopy, Heavy Metals, Heavy-Metals, Ions, Isotherms, Kinetics, Model, Montmorillonite, Particulate Organic Matter, Pseudo-Second Order, Pseudo-Second-Order, Sorption, Spectroscopy, Surface Complexation, Water, X-Ray Absorption Spectroscopy, XAFS

? Shi, X., Fu, H.Y., Li, Y., Mao, J.D., Zheng, S.R. and Zhu, D.Q. (2011), Impact of coal structural heterogeneity on the nonideal sorption of organic contaminants. *Environmental Toxicology and Chemistry*, **30** (6), 1310-1319.

Full Text: [2011\Env Tox Che30, 1310.pdf](2011/Env%20Tox%20Che30,%201310.pdf)

Abstract: Carbonaceous geosorbents (black carbon, coal, and humin/kerogen) play a primary role in the nonideal sorption (isotherm nonlinearity, hysteresis, and multiphasic kinetics) of hydrophobic organic chemicals by soils and sediments. The present study investigated the impact of coal structural heterogeneity on sorption/desorption of two model monoaromatic compounds (1,3-dichlorobenzene and 1,3-dinitrobenzene). Due to the higher degree of aromaticity and condensation, anthracite showed stronger sorption affinity and nonlinearity and slower sorption kinetics than lignite. Removal of humic substances by alkali extraction and/or mineral fraction by acidification did not much affect organic carbon-normalized sorption coefficient to the coal, suggesting nearly complete accessibility of adsorption sites on the condensed organic carbon. However, the treatments greatly increased sorption kinetics and meanwhile alleviated hysteresis of 1,3-dinitrobenzene, as compared with the original lignite. These observations were attributed to the enhanced exposure of high-energy adsorption sites on the condensed organic carbon after exfoliating the surface coverage by humic substances and minerals. An empirical biphasic pseudo-second-order model consisting of a fast sorption phase and a slow sorption phase adequately quantified the overall sorption kinetics for the coal sorbents. The results indicated that the condensed organic carbon, in combination with other structural components, controls the nonideal sorption of unburned coal. Environ. Toxicol. Chem. 2011;30:1310-1319. (C) 2011 SETAC.

Keywords: Adsorption, Anthracite, Aromatic-Compounds, Black Carbon, Distributed Reactivity Model, Harbor Sediments, Hysteresis, Isotherm, Kinetics, Lignite, Matter, Nuclear-Magnetic-Resonance, Phenanthrene Sorption, Removal, Scanning-Tunneling-Microscopy, Soils, Sorption

? Zhang, S.J., Shao, T., Kose, H.S. and Karanfil, T. (2012), Adsorption kinetics of aromatic compounds on carbon nanotubes and activated carbons. *Environmental Toxicology and Chemistry*, **31** (1), 79-85.

Full Text: [2012\Env Tox Che31, 79.pdf](2012/Env%20Tox%20Che31,%2079.pdf)

Abstract: Adsorption kinetics of two organic compounds on four types of carbonaceous adsorbents (a granular activated carbon [HD4000], an activated carbon fiber [ACF10], a single-walled carbon nanotube [SWNT], and a multiwalled carbon nanotube [MWNT]) was examined in aqueous solutions. The times needed for the adsorption to reach apparent equilibrium on the four carbons followed the order of ACF10>HD4000>SWNT>MWNT. Ultrasonication of the carbon nanotubes (CNTs) accelerated their adsorption kinetics but had no effect on their equilibrium adsorption capacities. The pseudo-second order model (PSOM) provided good fitting for the kinetic data. The fitting of kinetic data with the intraparticle diffusion model indicated that external mass transfer controls the sorption process in the organic compoundCNT systems, whereas intraparticle diffusion dominates in the sorption of organic compounds onto activated carbons. Environ. Toxicol. Chem. 2012;31:7985. (C) 2011 SETAC.

Keywords: 17-Alpha-Ethinyl Estradiol, Activated Carbon, Activated Carbon Fiber, Adsorbents, Adsorption, Adsorption Kinetics, Aqueous-Solutions, Bisphenol-A, Carbon Nanotubes, Equilibrium, Granular Activated Carbon, Hydrocarbons, Kinetic, Kinetics, Methylene-Blue, Organic Compound, Removal, Sorption, Thermodynamics

# Title: Environmental Toxicology and Water Quality

(Environ. Toxicol. Water Qual.)

Full Journal Title: [Environmental Toxicology and Water Quality](http://www3.interscience.wiley.com/journal/117935719/grouphome/home.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

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Subject Categories:

: Impact Factor

? Sato, M.I.Z., Monteiro, C.K., Stoppe, N.C., Sanchez, P.S., Ostini, S. and Matte, G.R. (1992), Shellfish and marine water microbiological quality. *Environmental Toxicology and Water Quality*, **7** (1), 95-105.

Full Text: [1992\Env Tox Wat Qua7, 95.pdf](1992/Env%20Tox%20Wat%20Qua7,%2095.pdf)

Abstract: Sewage discharge to the marine environment constitutes an important problem faced by public health and environmental managers, and exerts great economic and social impact on shellfish-producing areas. This study aims at characterizing the water quality and shellfish sanitary conditions of different growing areas on the northern coast of the Sao Paulo State. Seventy-two samples of water and shellfish were enumerated for total and fecal coliforms, and were analyzed for the presence of Salmonella. The most probable number of Vibrio parahaemolyticus was also determined for shellfish samples. Shellfish contamination was directly related to the bacteriological pollution of the water, such that in growing areas not contaminated with sewage discharges, 100% of shellfish samples presented themselves as being safe to be consumed. Salmonella was absent in all samples analyzed and V. parahaemolyticus was present in lower densities in shellfish samples. The percentage of water samples that did not comply to the standard were much higher than those of shellfish samples, indicating the need to reevaluate the permitted values of the Brazilian legislation both for shellfish “in natura” and for growing waters. This study also establishes the need for a better management of shellfish-producing areas, especially those more polluted, in parallel with the development of a Brazilian Shellfish Sanitation Program, in order to protect the quality of these organisms and consequently human health.

? Suzuki, T., Takahashi, N., Fukunaga, K., Okamura, M., Tanaka, T. and Takama, K. (1993), Intoxication of euglena cells by tributyltin chloride and its detoxication by pretreatment with high electric field loaded water. *Environmental Toxicology and Water Quality*, **8** (2), 207-222.

Full Text: [1993\Env Tox Wat Qua8, 207.pdf](1993/Env%20Tox%20Wat%20Qua8,%20207.pdf)

Abstract: Pollution of the marine environment by the antifouling organotin compounds such as tributyltin chloride (TBTCl) and tributyltin oxide (TBTO) is of concern to the public health and ecosystem stability. Consequently, there is a need to develop means for the decontamination of tin-intoxicated biota. In the present study, we used Euglena gracilis Z as a model organism to investigate the effect of various pretreatments on the restoration of TBTCl intoxicated cells. A brief exposure of Euglena cells to TBTCl (5×10-4-10-6 M), cells were found to change their shape into cyst form, and became almost inactive within a few minutes. TBTCl was rapidly incorporated into the Euglena cell, and was largely located in the cytosol + microsomes fraction. When TBTCl-intoxicated Euglena cells were transferred into organotin free medium, TBTCl content in the cells decreased. However, cells neither regained motility nor did their shape return to normal. When the intoxicated cells were incubated in water that was prepared by being loaded with high voltage condenser electric potential of 12 kV for 70 h, the cells regained motility, and their shape returned to almost normal by excluding tin prior to regaining motility. The study results may lead to a practical means for the decontamination of polluted biota.

? Peter, S., Siersdorfer, C., Kaltwasser, H. and Geiger, M. (1995), Toxicity estimation of treated coke plant waste-water using the luminescent bacteria assay and the algal growth-inhibition test. *Environmental Toxicology and Water Quality*, **10** (3), 179-184.

Full Text: 1995\Env Tox Wat Qua10, 179.pdf

Abstract: Among several bioassays, the Scenedesmus subspicatus chlorophyll fluorescence test and the Photobacterium phosphoreum bioluminescence assay were selected to examine their applicability for toxicity evaluation of changes in coke plant effluent quality. In addition to the ecotoxicological parameters, a chemical analysis of dissolved organic carbon (DOG), ammonia-N, and nitrate-N was performed. It was demonstrated that the toxicity values obtained from the bioassays give a first indication on potential hazard and successful treatment. Decreasing toxicity values went along with decreasing DOC or ammonia-N values, but the sensitivity toward DOC reduction was higher. Sensitivity toward pure compounds was assessed by comparing the EC(50) values of the luminescent bacteria assay with the corresponding EC(50) values of the algal bioassay. The data showed a poor correlation between the two bioassays. (C) 1995 by John Wiley and Sons, Inc.

Keywords: Coke Plant, Oxidation, Treatment

? Mendoza, C.A., Cortes, G. and Munoz, D. (1996), Heavy metal pollution in soils and sediments of Rural Developing District 063, Mexico. *Environmental Toxicology and Water Quality*, **11** (4), 327-333.

Full Text: [1996\Env Tox Wat Qua11, 327.pdf](1996/Env%20Tox%20Wat%20Qua11,%20327.pdf)

Abstract: For over 100 years the Rural Developing District 063 (RDD-063), which is located in Hidalgo State, has received wastewater without treatment from Mexico City. This wastewater has been used as irrigation water in agriculture, so high amounts of toxic substances have been deposited in the soils and sediments of this area, including heavy metals. Heavy metals are not biodegraded and persist in the environment for long time, so the goal of this study was to evaluate the bioavailable concentration of four heavy metals (Cd, Co, Cr, and Pb) by atomic absorption spectrophotometry during three sampling periods in 1993. The results show increasing levels of cadmium and lead during July (second sampling period), while cobalt had its highest level in March (first sampling period). Finally, chromium data presented an irregular pattern during the whole year. The high levels of these elements indicate major pollution problems in RDD-063, which may represent increased health risks for humans and animals. (C) 1996 by John Wiley & Sons, Inc.

# Title: Environmetrics

Full Journal Title: [Environmetrics](http://www3.interscience.wiley.com/cgi-bin/jtoc?ID=6285)

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Subject Categories:

Environmental Sciences: Impact Factor 0.156, 94/126 (1999), Impact Factor 0.324, 110/127 (2000)

Tatistics & Probability: Impact Factor

? Opsomer, J.D., Agras, J., Carpi, A. and Rodrigues, G. (1995), An application of locally weighted regression to airborne mercury deposition around an incinerator site. *Environmetrics*, **6** (2), 205-219.

Abstract: In this paper the deposition of mercury around an incinerator site is modelled using a non-parametric technique, locally weighted least squares regression, We begin by summarizing current theory on how multivariate locally weighted linear regression can be used to generate a regression surface and to construct approximate F-tests. We detail a simple implementation of the method that does not involve an adaptive bandwidth, This method is then applied to data on mercury accumulation in moss samples around an incinerator site, a situation where parametric modelling is not appropriate because of the small sample size and the presence of many potential covariates. The predicted regression surfaces are displayed using different bandwidth choices and suggest that the incinerator indeed affects the spatial distribution of mercury in the immediate vicinity of the incinerator. Approximate F-tests indicate that this effect is statistically significant at the 10 per cent level only after the moss samples have been oven-dried, A potential explanation for this finding based on the relative volatility of different mercury species is discussed.

Keywords: Locally Weighted Regression, Hypothesis Testing, Airborne Mercury Deposition, Mercury Accumulation In Moss, Incineration, Local Linear Regression

? Bonham, G.H. (1995), Health and environment: Public-health decisions based on evidence, psychology and politics. *Environmetrics*, **6** (3), 311-318.

Abstract: The concern is with the magnitude of Alzheimer’s disease as a social and health problem and with the appropriateness of public action when there is a lack of firm international consensus on the role of aluminium either as a causative agent or as a factor contributing to the prevalence of Alzheimer’s disease. From an examination of current and historical events, there is an analysis of the reasons why some technologies and health measures translate easily towards appropriate public action or public policy whereas others trigger little or no response. The concept of congruence of interest is utilized. When there is a lack of international consensus the appropriateness of prudent avoidance and of collateral justification is discussed. Further priorities for research are suggested.

# Title: Enzyme and Microbial Technology

Full Journal Title: [Enzyme and Microbial Technology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5241&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=a05ba4bf77785cf95774d929b659cd3b), [Enzyme and Microbial Technology](http://www.ingentaconnect.com/content/els/01410229), [Enzyme and Microbial Technology](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=01410229)

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Subject Categories:

Biotechnology & Applied Microbiology: Impact Factor

Wainwright, M., Grayston, S.J. and de Jong, P. (1986), Adsorption of insoluble compounds by mycelium of the fungus *Mucor flavus*. *Enzyme and Microbial Technology*, **8** (10), 597-600.

Full Text: [E\Enz Mic Tec8, 597.pdf](E/Enz%20Mic%20Tec8,%20597.pdf)

Abstract: Mycelium of Mucor flavus Bainier adsorbed calcium silicate, elemental sulphur, lead sulphide and zinc dust from water suspension. The fungus also adsorbed ochre (ferric hydroxide) from acid mine drainage. Ochre adsorption occurred optimally at 25°C and increased with increasing proportion of mycelium to ochre. The addition of a carbon source to the mine drainage on the other hand resulted in a decrease in the amount of ferric hydroxide adsorbed. *Aspergillus niger*, Fusarium solani and Penicillium notatum also adsorbed ochre, but much less effectively than did M. flavus. The possible industrial applications of this phenomenon are commented upon.

Keywords: Fungi, Biosorption, Waste Recovery

Bordons, A. and Jofre, J. (1987), Extracellular adsorption of nickel by a strain of *Pseudomonas* sp. *Enzyme and Microbial Technology*, **9** (12), 709-713.

Full Text: [E\Enz Mic Tec9, 709.pdf](E/Enz%20Mic%20Tec9,%20709.pdf)

Abstract: A strain of *Pseudomonas* has been studied for its nickel accumulation capacity. Most assays were carried out exposing cells to the metal in a resting state. Results indicate an extracellular, metabolically independent adsorption that is decreased by the presence of acetate. A possible exchange of nickel for magnesium from the outer membrane is suggested. Nickel tolerance of this strain in minimal medium is limited.

Keywords: Nickel, Accumulation, *Pseudomonas*, Adsorption, Heavy-Metals Removal, Resting Cells

Tobin, J.M., Cooper, D.G. and Neufeld, R.J. (1990), Investigation of the mechanism of metal uptake by denatured *Rhizopus arrhizus* biomass. *Enzyme and Microbial Technology*, **12** (8), 591-595.

Full Text: [E\Enz Mic Tec12, 591.pdf](E/Enz%20Mic%20Tec12,%20591.pdf)

Abstract: Chemical treatments to denatured *Rhizopus arrhizus* biomass were found to cause reductions in metal uptake capacities as high as 60%. Phosphate and carboxyl groups were identified as important moeities involved in metal binding. Scatchard analyses of uptake isotherms of native biomass confirm the existence of more than one type of binding site. An uptake model involving binding to a multiplicity of nonequivalent sites is proposed. The primary interactions are due to a complexation mechanism involving sites in the biomass containing carboxylate, phosphate, and other functional groups. Uptake may be enhanced by electrostatic attraction to negatively charged functional groups, but this is a secondary mechanism.

Keywords: *Rhizopus Arrhizus*, Metal Upake, Isotherms, Scatchard Analyses, Carboxylate, Phosphates, Uptake Model, Complexation Mechanism

? Meikle, A.J., Gadd, G.M. and Reed, R.H. (1990), Manipulation of yeast for transport studies: Critical assessment of cultural and experimental procedures. *Enzyme and Microbial Technology*, **12** (11), 865-872.

Full Text: [1990\Enz Mic Tec12, 865.pdf](1990/Enz%20Mic%20Tec12,%20865.pdf)

Abstract: In the manipulation of Saccharomyces cerevisiae and other yeasts for transport studies, several factors must be taken into account. These include growth and cultural procedures, harvest, and suspension in an appropriate medium with a suitable substrate concentration. Of particular importance is suspension density, since if this is high, it may limit the availability of exogenous solute for transport and thus affect the rate of accumulation and intracellular/extracellular solute concentrations. This has been demonstrated with respect to the uptake of 2-deoxy-D-glucose (DOG) by S. cerevisiae, where a low suspension density of 0.27 μl (cell volume) ml (medium volume)-1 resulted in a high initial rate of uptake, a higher accumulation ratio, and negligible disappearance of DOG from the external medium, contrasting with a high suspension density of 20 μl (cell volume) ml (medium volume)-1, where the initial rate of uptake and accumulation ratio were lower, coupled with a substantial decrease in external DOG concentration. Such factors have a significant influence on the analysis and interpretation of transport data and should always be considered. Published reports of yeast transport studies should contain sufficient relevant, detailed information so that these effects can be fully evaluated.

Keywords: Saccharomyces Cerevisiae, Yeast, Suspension Density, Transport, 2-Deoxy-D-Glucose, Solute Accumulation

? Suh, Y.J., Park, J.M. and Yang, J.W. (1994), Biodegradation of cyanide compounds by pseudomonas-fluorescens immobilized on zeolite. *Enzyme and Microbial Technology*, **16** (6), 529-533.

Full Text: [1994\Enz Mic Tec16, 529.pdf](1994/Enz%20Mic%20Tec16,%20529.pdf)

Abstract: A cyanide-degrading bacteria, Pseudomonas fluorescens NCIB 11764, was used for the treatment of wastewater containing cyanide. After successive subculture for 2 months in cyanide-containing medium, cultures were fully adapted to cyanide and able to grow in a medium containing up to 260 mg l-1 of cyanide. By fed-batch culture supplying only cyanide, it was confirmed that cyanide was the limiting nutrient as a nitrogen source. Ammonia was found to inhibit cyanide degradation, and the rate of degradation was halved when the ammonia concentration was higher than 1 mM. In a 15-l jar fermenter, 26 mg l-1 of cyanide was consumed almost completely within 48 h and the final yield of growth on cyanide was calculated as 4.21 mg dry cell wt mg-1 CN. Cells of P. fluorescens were immobilized on zeolite and applied to a modified activated sludge-type reactor to mimic the actual activated sludge system of a coke-plant wastewater treatment system. In this immobilized system operated batchwise, 26 mg l-1 of cyanide was degraded completely by 8 g l-1 of immobilized particles within 10 h. The same reactor system was operated in a continuous mode, and the cyanide concentration of the outlet reached the stationary-state level of less than 0.1 mg l-1 within 2 days at 0.041 h-1 of dilution rate and within 3 days at 0.082 h-1 of dilution rate, respectively.

Keywords: Activated Sludge, Ammonia, Coke Plant, Coke Plant Wastewater, Coke-Plant Wastewater, Cyanide, Cyanide, Iodegradation, Degradation, Growth, Nitrogen, Pseudomonas Fluorescens, Strain, Treatment, Utilizes Cyanide, Wastewater, Wastewater Treatment, Zeolite

Brady, D. and Duncan, J.R. (1994), Binding of heavy metals by the cell walls of *Saccharomyces cerevisiae*. *Enzyme and Microbial Technology*, **16** (7), 633-638.

Full Text: [E\Enz Mic Tec16, 633.pdf](E/Enz%20Mic%20Tec16,%20633.pdf)

Abstract: The isolated cell walls of the yeast *Saccharomyces cerevisiae* bound the heavy metals Cu2+, Cd2+, and Co2+ (0.40, 0.17, and 0.11 μmol mg−1 metal per wall dry mass). Chemical modification of the isolated cell walls modified their capacity to accumulate Cu2+ cations. The blocking of amino, carboxyl, or hydroxyl groups reduced the quantity of Cu2+ accumulated, indicating that they may each play a role in the binding of Cu2+. This in turn indicates that both the protein and the carbohydrate fractions of the cell walls are involved in heavy metal cation binding. Scatchard analysis of the binding of metal cations to both chemically modified and unmodified isolated cell walls indicates that there are different types of binding site.

Keywords: Metals, Cell Walls, Yeast, Binding

Brady, J.M. and Tobin, J.M. (1994), Adsorption of metal ions by *Rhizopus arrhizus* biomass: Characterization studies. *Enzyme and Microbial Technology*, **16** (8), 671-675.

Full Text: [E\Enz Mic Tec16, 671.pdf](E/Enz%20Mic%20Tec16,%20671.pdf)

Abstract: Freeze-dired, oven-dried, and nonmetabolizing live *Rhizopus arrhizus* biomass were tested for their capacity to adsorb the test ions, Sr2+, cd2+, and Cu2+, over the pH range 4–6. Metal uptake values for each biomass type were found to increase in the order Cu2+ > Cd2+ > Sr2+. Freeze-dried biomass proved to be the most efficient biomass type for metal adsorption, followed in order by oven-dried and live biomass for Sr2+ systems, and live and oven-dried biomass for Cd2+ and Cu2+ systems. Each test ion displaced constant levels of Ca2+ and Mg2+ ions from the three biomass types, indicating that biomass pretreatment had no apparent effect on the ion-exchange capacity of *Rhizopus arrhizus*. Similarly, the levels of H+ displacement resulting from test ion adsorption were unaffected by pretreatment but were found to increase in the order Cu2+ > Cd2+ > Sr2+. Linear reciprocal Langmuir and Scatchard transformation plots reflected the predominantly ion-exchange mechanism of Sr2+ and Cd2+ adsorption, and a curved Scatchard transformation plot reflected the more covalent nature of Cu2+ adsorption.

Keywords: *Rhizopus Arrhizus*, Metal Ions, Adsorption, Isotherms, Hard and Soft Metals

Knapp, J.S., Newby, P.S. and Reece, L.P. (1995), Decolorization of dyes by wood-rotting basidiomycete fungi. *Enzyme and Microbial Technology*, **17** (7), 664-668.

Full Text: [E\Enz Mic Tec17, 664.pdf](E/Enz%20Mic%20Tec17,%20664.pdf)

Abstract: The ability of seven different isolates of wood-rotting fungi to decolorize a wide range of structurally different synthetic dyes was investigated. All isolates decolorized some dyes, and all dyes were decolorized to some extent. Color removal efficiency varied from 100% to only ca. 50% at most for chrysophenine. Some decolorizations were extremely rapid. Two isolates reduced the A(625) of a solution of brilliant green from 57 to 0.5 in 1 day. No one isolate proved to be best for all dyes, and same were poor in most tests. Phanerochaete chrysosporium was among the least effective of the isolates. The screening system, which was unoptimized, employed mycelial mats pregrown on malt extract medium and supplied with an energy source, glucose, together with the dye.

Keywords: Azo, Azo Dyes, Biodegradation, Decolorization, Degradation, Dye, Dyes, Effluent Treatment, Ligninase, Phanerochaete Chrysosporium, Phanerochaete-Chrysosporium, Polymeric Dyes, Removal, Screening, White Rot Fungi

Brady, J.M. and Tobin, J.M. (1995), Binding of hard and soft metal ions to *Rhizopus arrhizus* biomass. *Enzyme and Microbial Technology*, **17** (9), 791-796.

Full Text: [E\Enz Mic Tec17, 791.pdf](E/Enz%20Mic%20Tec17,%20791.pdf)

Abstract: The greater the covalent index value of a metal ion, the greater its potential to form covalent bonds with biological ligands. In this study, freeze-dried *Rhizopus arrhizus* biomass was tested for its potential to adsorb the hard metal ion Sr2+ and the borderline metal ions Mn2+, Zn2+, Cd2+, Cu2+, and Pb2+ from aqueous solutions. Equilibrium metal uptake values increased in the order: Sr2+ < Mn2+ < Zn2+ < Cd2+ < Cu2+ < Pb2+, and were positively correlated with the covalent index of the metal ions. Equilibrium was rapid and 95% complete within 5 min of contacting the metal ions with the biomass. The potential of the test ions to displace preloaded borderline metals ions from the biomass increased with increasing covalent index. In the case where the hard metal ion Sr2+ was preloaded, the displacement potential of the borderline test ions decreased with increasing covalent index, except for Pb2+, which totally displaced the preloaded Sr2+. The potential of a preloaded test ion to inhibit the adsorption of another test ion was also investigated, and similar trends to the displacement studies were observed. As a consequence of test ion adsorption, Ca2+ and Mg2+ displacement from the biomass ligands was observed for each test ion and H+ displacement was observed for the borderline test ions only. Overall, the hard metal Sr2+ was found to exhibit ionic binding only, whereas the borderline test ions exhibited a significant degree of covalent binding.

Keywords: Biosorption, *Rhizopus Arrhizus*, Hard and Soft Metal Ions, Covalent Index

Aksu, Z. and Bülbül, G. (1998), Investigation of the combined effects of external mass transfer and biodegradation rates on phenol removal using immobilized *P. putida* in a packed-bed column reactor. *Enzyme and Microbial Technology*, **22** (5), 397-403.

Full Text: [E\Enz Mic Tec22, 397.pdf](E/Enz%20Mic%20Tec22,%20397.pdf)

Abstract: A quantitative analysis of external mass transfer combined with a biodegradation reaction and correlation of the experiment with theory was performed for phenol removal using calcium-alginate gel-immobilized P. putida in a packed-bed column reactor Assuming first-order biodegradation kinetics, pseudo first-order biodegradation rate constants (k(p)) were calculated. To investigate the effect of external film diffusion on the biodegradation rate, various mass transfer correlation models of the type j(D) = KNRe-(l-n) were systematically tested and the mass transfer coefficients (k(m)) were calculated as a function of the mass flux (G) and the Reynolds number (N-Re) at different n values. The intrinsic first-order biodegradation rate constants (k) and the surface areas per unit weight of dried cells for mass transfer (A(m)) were determined from 1/k(p) vs. I/G(n) plots at the same n values. Finally, combining the k values with k(m)A(m) values, the pseudo first-order biodegradation rate constants (k(p)) were calculated again and compared with the k(p) values determined from experimental data, thus, it was decided that the mass transfer correlation j(D) = 1.625 Re-0.507 accurately predicted our experimental data. (C) 1998 Elsevier Science Inc.

Keywords: Phenol Biodegradation, Ca-Alginate Gel-Immobilized P-Putida, Packed-Bed Column Reactor, First-Order Biodegradation Kinetics, External Film Diffusion, Mass Transfer Coefficient, Whole Cells

Sani, R.K. and Banerjee, U.C. (1999), Decolorization of triphenylmethane dyes and textile and dye-stuff effluent by *Kurthia* sp. *Enzyme and Microbial Technology*, **24** (7), 433-437.

Full Text: [E\Enz Mic Tec25, 433.pdf](E/Enz%20Mic%20Tec25,%20433.pdf)

Abstract: A number of soil and water samples were collected from the vicinity of effluent treatment plant of a textile and dyeing industry. Several organisms were screened for their ability to decolorize triphenylmethane group of dyes. A Kurthia sp. was selected on the basis of rapid dye decolorizing activity. Under aerobic conditions, 98% color was removed intracellularly by this strain. A number of triphenylmethane dyes, such as magenta, crystal violet, pararosaniline, brilliant green, malachite green, ethyl violet and textile and dyestuff effluent used in this study. The rates of decolorization of magenta (92%) crystal violet (96%) malachite gr een (96%) pararosaniline (100%) and brilliant green (100%) were found to be more than that of ethyl violet (8%). After the decolorization of most of the dyes, viable cell concentration of the Kurthia sp. reduced significantly. In the case of ethyl violet, viable cell concentration was almost negligible after decolorization. The extent of decolorization of synthetic effluent (98%) was more in comparison to textile and dye-stuff effluent (56%). After biotransformation, the extent of COD reduction of the cell free extracts of triphenylmethane dyes was higher (more than 88%, except in the case of ethyl violet, 70%) in comparison to textile and dye-stuff effluent. (C) 1999 Elsevier Science Inc. All rights reserved.

Keywords: Biotransformation, Decolorization, Triphenylmethane Dyes, Synthetic Effluent, Textile and Dye-Stuff Effluent, Chemical Oxygen Demand, Kurthia sp., Crystal-Violet, *Phanerochaete-Chrysosporium*, Biodegradation, Degradation, Fungi

Aksu, Z. and Bülbül, G. (1999), Determination of the effective diffusion coefficient of phenol in Ca-alginate-immobilized *P. putida* beads. *Enzyme and Microbial Technology*, **25** (3-5), 344-348.

Full Text: [E\Enz Mic Tec25, 344.pdf](E/Enz%20Mic%20Tec25,%20344.pdf)

Abstract: The biodegradation kinetics of phenol including biodegradation and diffusion together was investigated in Ca-alginate-immobilized *Pseudomonas putida* beads as a function of particle size in a batch system. The effective diffusion coefficient of phenol in the bead was predicted assuming first-order biodegradation kinetics. For this purpose, the effect of phenol concentration (Cs) on the biodegradation rate (v) was investigated and the first-order biodegradation rate constants for free and different sized immobilized particles were determined from Cs vs. v plots. Using biodegradation rates, experimental effectiveness factors (eta) were determined at 100 mg/l bulk phenol concentration. Thiele modulus, which is a function of particle size, effective diffusion coefficient, and first-order biodegradation rate constant was evaluated from the experimental effectiveness factor and effective diffusion coefficient was calculated from the Thiele modulus formulae for each particle size. The results showed that intraparticle diffusion resistance has a significant effect on the phenol biodegradation rate. (C) 1999 Elsevier Science Inc. All rights reserved.

Keywords: Phenol Biodegradation, Ca-Alginate Gel-Immobilized p. Putida, First-Order Biodegradation Kinetics, Effective Diffusion Coefficient of Phenol, Calcium Alginate, Gel Beads, Cells

Donmez, G. (2002), Bioaccumulation of the reactive textile dyes by *Candida tropicalis* growing in molasses medium. *Enzyme and Microbial Technology*, **30** (3), 363-366.

Full Text: [E\Enz Mic Tec30, 363.pdf](E/Enz%20Mic%20Tec30,%20363.pdf)

Abstract: Bioaccumulation of the reactive textile dyes, Remazol Blue, Reactive Black and Reactive Red, by the yeast species Candida tropicalis growing in molasses medium was studied in a batch system as a function of initial pH and initial dye concentration. The optimum pH value for bioaccumulation was determined as 3.0 for all the dyes tested. The maximum specific bioaccumulation capacity of C tropicalis was 111.9 mg g-1 for Remazol Blue, 101.9 mg g-1 for Reactive Black and 79.3 mg g-1 for Reactive Red at approximately 700 mg l-1 initial dye concentration. Higher bioaccumulation percentages were observed at lower concentrations of all the dyes. In general, the increase in dye concentration inhibited the growth of yeast and caused a long lag period. Remazol Blue dye gave a considerably higher dye bioaccumulation percentage by the yeast among the dyes tested. (C) 2002 Elsevier Science Inc. All rights reserved.

Keywords: Candida Tropicalis, Bioaccumulation, Remazol Blue, Reactive Black, Reactive Red, Decolorization, Versicolor, Removal, Water

O’Mahony, T., Guibal, E. and Tobin, J.M. (2002), Reactive dye biosorption by *Rhizopus arrhizus* biomass. *Enzyme and Microbial Technology*, **31** (4), 456-463.

Full Text: [E\Enz Mic Tec31, 456.pdf](E/Enz%20Mic%20Tec31,%20456.pdf)

Abstract: The biosorption of three commonly used reactive dyes, from aqueous solutions by oven-dried *Rhizopus arrhizus* biomass was studied in a batch system with respect to pH, initial dye concentration and initial metal ion concentration. The biomass exhibited maximum dye uptake at pH 2 due to its positively charged nature at acidic pH and the anionic nature of the reactive dyes. Reactive orange 16 dye was adsorbed most effectively to a maximum of approximately 200 mg/g. The presence of high levels of cadmium did not significantly impair the adsorption capacity of the biomass. Dye removal from a multicomponent solution of all three dyes was also achieved. *Rhizopus* biomass was found to exhibit superior removal properties than activated charcoal. (C) 2002 Elsevier Science Inc. All rights reserved.

Keywords: Reactive Dyes, Biosorption, *Rhizopus arrhizus*, Activated Charcoal, Uptake, Textile Effluent, Metal-Ions, Aqueous-Solution, Removal, Batch, Decolorization, Biodegradation, Adsorption, System, Carbon

Huang, C.C., Su, C.C., Hsieh, J.L., Tseng, C.P., Lin, P.J. and Chang, J.S. (2003), Polypeptides for heavy-metal biosorption: capacity and specificity of two heterogeneous MerP proteins. *Enzyme and Microbial Technology*, **33** (4), 379-385.

Full Text: [E\Enz Mic Tec33, 379.pdf](E/Enz%20Mic%20Tec33,%20379.pdf)

Abstract: MerP protein possesses a highly conserved domain with two cysteine residues for Hg2+ binding. The MerP protein originated from *mer* operon of Gram-positive bacterium *Bacillus cereus* RC607 possesses adjoining two cysteines while that of Gram-negative bacterium *Pseudomonas* sp. K-62 contains two cysteines separated by spacing two other residues. Both heterogeneous *merP* genes were cloned and over-expressed in *Escherichia coli* BL21 hosts. The resulting recombinant strains exhibited a six- to eightfold increase in Hg2+ resistance and an 10% increase in Hg2+ adsorption capacity. The *merP* over-expressed strain harboring Gram-positive *merP* had 142, 84 and 33% increase for Cu2+, Cd2+ and Pb2+ adsorption capability, respectively, over that of *merP*-free host cells. The strain carrying Gram-negative *merP* also increased 47, 55 and 12% for Cu2+, Cd2+ and Pb2+ adsorption, respectively. Multi-metal biosorption experiments showed that the affinity of metal biosorption by the recombinant strains decreased in the order of Cu>Pb>Cd. Peptides containing the amino acid sequences of metal-binding motif for both heterogeneous MerP proteins were chemically synthesized and covalently immobilized on Celite carriers to examine their metal-binding ability. For *Bacillus* MerP-originated peptides, the binding capacity was 0.72, 0.45 and 0.36 mol/mol peptide for Cu, Cd and Pb, respectively, while the capacity was 0.51 0.45 and 0.31 mol/mol peptide for Cu, Cd and Pb, respectively, for the peptide containing *Pseudomonas* MerP metal-binding motif. These results may show that MerP with adjoining cysteines seems to be more effective in binding metals than that with two separated cysteines.

Keywords: MerP Proteins, *Bacillus Cereus*, RC607, *Pseudomonas* sp. K-62, Biosorption

Wang, L., Zhou, Q. and Ren, D.M. (2004), Comprehensive analysis of the variation of Cu2+ adsorption capacity of *Pseudomonas putida* 5-x cell envelope with cell age. *Enzyme and Microbial Technology*, **34** (5), 474-481.

Full Text: [E\Enz Mic Tec34, 474.pdf](E/Enz%20Mic%20Tec34,%20474.pdf)

Abstract: The variation of Cu2+ adsorption capacity of Pseudomonas putida 5-x cell envelope with cell age was studied. Results showed that cell surface components in the cell envelope, such as the peptidoglycan layer, outer and inner membranes, all contributed to the Cu2+ adsorption by P. putida 5-x cell envelope. The content of the peptidoglycan layer, and the outer and inner membranes in the cell envelope varied, while the Cu2+ adsorption capacities of separated outer and inner membranes varied in different growth phases. But the adsorption capacity of separated PEG layer remained constant in all growth phases. The variation of adsorption capacity of the cell envelope with cell age is mainly due to the variation of the contents of the peptidoglycan layer, and the outer and inner membranes in the cell envelope, as well as the variation of adsorption capacities of the outer and inner membranes in different cell ages. In addition, the variation of both phospholipid and lipopolysaccharide content in the outer membrane, and phospholipid content in the inner membrane with cell age resulted in the variation of adsorption capacities of the outer and inner membranes in different cell ages. (C) 2004 Elsevier Inc. All rights reserved.

Keywords: Bacteria, Binding, Biomass, Biosorption, Escherichia-Coli, Heavy-Metals, Inner Membrane, Ions, Lipopolysaccharide, Outer Membrane, Outer-Membrane, Peptidoglycan Layer, Phospholipid, Protein, Recovery, Removal

Kargi, F. and Ozmıhcı, S. (2004), Biosorption performance of powdered activated sludge for removal of different dyestuffs. *Enzyme and Microbial Technology*, **35** (2-3), 267-271.

Full Text: [E\Enz Mic Tec35, 267.pdf](E/Enz%20Mic%20Tec35,%20267.pdf)

Abstract: Removal of dyestuffs from industrial wastewaters require special advanced technologies since dyes are usually difficult to remove by biological methods. Adsorption of dyestuffs on solid adsorbents such as powdered activated carbon (PAC) is one of the methods commonly used for the removal of these compounds. As an alternative to PAC, a new adsorbent material, powdered activated sludge (PAS) was used for removal of different dyestuffs from aqueous media in this study. The rate and extent of dyestuff removal by acid washed powdered activated sludge were evaluated for six different dyestuffs. Dyestuff removal performance of PAS increased with increasing concentrations of PAS for all dyestuffs tested. Removal of Direct Yellow 12 was superior to the other dyes tested and the lowest removal efficiency was obtained with Levafix rot. Different adsorption isotherms were tested to represent the equilibrium adsorption data and the Freundlich isotherm was found to be the most suitable isotherm. Adsorption isotherm constants of Direct Yellow 12 were determined for all isotherms tested.

Keywords: Biosorption, Dyestuff, Powdered Activated Sludge (PAS)

? Tan, T.W., Hu, B. and Su, H.J. (2004), Adsorption of Ni2+ on amine-modified mycelium of *Penicillium chrysogenum*. *Enzyme and Microbial Technology*, **35** (6-7), 508-513.

Full Text: [2004\Enz Mic Tec35, 508.pdf](2004/Enz%20Mic%20Tec35,%20508.pdf)

Abstract: An effective heavy metal ion adsorbent was prepared by a simple amine modification on mycelium from biomass of penicillin fermentation. The maximum adsorption capacity for Ni2+ could reach 260 mg/g after modification. The adsorbed Ni2+ could be easily desorbed by 0.01% EDTA or 0.2-0.5% HCl solution. The mechanical strength of the adsorbent was also improved after modification and the new adsorbent could be reused for at least 10 cycles without losing its uptake. The low cost adsorbent has a potential in large scale heavy metal ion wastewater treatment. (C) 2004 Published by Elsevier Inc.

Keywords: Adsorption, Adsorption Capacity, Biomass, Biosorption, Heavy Metal Ion, Metal-Ions, Modification, Mycelium, Ni2+, Rhizopus-Arrhizus, Wastewater Treatment, Zinc

Cabrera, G., Gómez, J.M. and Cantero, D. (2005), Kinetic study of ferrous sulphate oxidation of *Acidithiobacillus ferrooxidans* in the presence of heavy metal ions. *Enzyme and Microbial Technology*, **36** (2-3), 301-306.

Full Text: [E\Enz Mic Tec36, 301.pdf](E/Enz%20Mic%20Tec36,%20301.pdf)

Abstract: Acidophilic microorganisms such as Acidithiobacillus ferrooxidans have the capability to carry out processes of bioleaching, biosorption and bioprecipitation of heavy metal ions, which have important environmental applications. At. ferrooxidans derives the energy for their metabolism from ferrous iron oxidation, process, which can be affected by the presence of heavy metals in the medium. Moreover, organic matter produces an inhibitory effect over the ferrous iron oxidation of At. ferrooxidans. In this work, heterotrophic bacterium *Acidiphilium sp*. was added when the medium is supplemented with organic matter to reduce this negative effect. The purpose of this work is the kinetic study of ferrous sulphate oxidation by At. ferrooxidans in the presence of different concentrations of several heavy metal ions (Cr(III), Cu(II), Cd(II), Zn(II) and Ni(II)) and compare this kinetic behaviour with a mixed culture with *Acidiphilium sp*.

The obtained results show a non-competitive inhibition of heavy metals over bacterial oxidation of ferrous sulphate. In accordance with this kind of inhibition, a kinetic equation has been proposed to predict the behaviour of At. ferrooxidans in the presence of heavy metals in the range of concentrations studied.

Keywords: *Acidiphilium sp*., Acidithiobacillus Ferrooxidans, Ferrous Sulphate Oxidation, Heavy Metal, Kinetics

? Wu, J.Y., Hwang, S.C.J., Chen, C.T. and Chen, K.C. (2005), Decolorization of azo dye in a FBR reactor using immobilized bacteria. *Enzyme and Microbial Technology*, **37** (1), 102-112.

Full Text: [2005\Enz Mic Tec37, 102.pdf](2005/Enz%20Mic%20Tec37,%20102.pdf)

Abstract: Decolorization of azo dye (RED RBN) was carried out experimentally in a liquid-solid fluidized bed reactor (FBR) using polyvinyl alcohol (PVA)-immobilized cell beads as support carriers. The effects of various operating conditions such as bed expansion, cell bead number density, initial dye concentration, hydraulic retention time (HRT), and diameters of immobilized cell beads on the decolorization of azo dye were demonstrated experimentally. It was found that azo dye degradation time reaching initially a steady state decreased with an increase in bed expansion, cell bead number density as well as HRT. The mean cell residence time (theta(C)) in FBR using PVA-immobilized cell beads increased insignificantly from 1014.1 to 1014.9 days as the HRT increased from 3 to 24 h, and thus the impact of convectional reduced theta(C) could be minimized by using the same polymer as support carriers. In addition, a mathematical model was used to describe the simultaneous diffusion and reaction of azo dye in the FBR. The internal mass-transfer resistance, rather than the film diffusion resistance, played an important role in azo dye utilization in FBR when film modulus (m(f)) was smaller than 1. The model was employed to analyze and predict both the k(L) value and the operational efficiency of FBR (which was running in a well-mixed state) in azo dye biodegradation using immobilized cell beads during a steady-state operation. The simulated results corresponded satisfactorily with the experimental data in the azo dye concentration ranging up to 2200 mg L-1. (c) 2005 Elsevier Inc. All rights reserved.

Keywords: Azo Dye, Decolorization, Pva, Immobilized-Cell Beads, Fluidized-Bed Reactor, Liquid-Fluidized-Beds, Mass-Transfer, Waste-Water, Microbial Decolorization, Nitrogen Removal, Cell Beads, Microorganisms, Degradation, Bioreactor, Reduction

? Whiteley, C.G. and Lee, D.J. (2006), Enzyme technology and biological remediation. *Enzyme and Microbial Technology*, **38** (3-4), 291-316.

Full Text: [2006\Enz Mic Tec38, 219.pdf](2006/Enz%20Mic%20Tec38,%20219.pdf)

Abstract: The heterogeneous complexity of sludges and wastewaters has created gross uncertainty and deviations in predictions of suitable models for their measurement. At the same time, it is becoming increasingly obvious that the current paradigms and ideologies are wrought with problems and limitations suggesting the need to move to a more consolidated analytical objective evaluation. Rapid developments in understanding activated sludge processes and wastewater remediation warrants exploitation of different strategies for studying their degradation.

It is time to replace subjective terms like sludge volume index (SVI), zone settling velocity (ZSV), filament index (F-I), fractal dimension (D), flocculating ability, surface charge (zeta), degree of hydrophobicity, chemical oxygen demand (COD) with a mathematical one that can provide an absolute quantitative relationship for the properties of wastewater and/or a sludge floc. There are no current objective values that can be introduced to represent the plethora of biological remediation terminologies such as bioleaching, biosorption, bioaugmentation, biostimulation, biopulping, biodeterioration, biobleaching, bioaccumulation, biotransformation and bioattenuation.

Enzyme technology has been receiving increased attention and this review focuses on the latest developments on the enzymology of biological remediation. It discusses the present pitfalls with current strategies and suggests that sludge-floc parameters, such as internal structure and composition, sludge retention time, microbial ecology, nutrient concentration, dissolved oxygen and type of industrial wastewater, whether from an aerobic or anaerobic system, are replaced by quantitative kinetic terms (K-m, V-max, K-cat) associated with the enzymology of the sludge floc and/or wastewater. (c) 2005 Elsevier Inc. All rights reserved.

Keywords: Aerobic, Anaerobic Bioremediation, Enzymology, Sulfate-Reducing Bacteria, Polycyclic Aromatic-Hydrocarbons, White-Rot Fungi, Extracellular Polymeric Substances, Anaerobic Sulphidogenic Bioreactor, Thermoautotrophicum Strain Marburg, Denitrifying Pseudomonas sp, Sulfur Oxygenase Reductase, Primary Sludge Hydrolysis, Pyruvate Formate-Lyase

? Kargi, F. and Cikla, S. (2006), Biosorption of zinc(II) ions onto powdered waste sludge (PWS): Kinetics and isotherms. *Enzyme and Microbial Technology*, **38** (5), 705-710.

Full Text: [2006\Enz Mic Tec38, 705.pdf](2006/Enz%20Mic%20Tec38,%20705.pdf)

Abstract: Waste sludge samples obtained from a paint industry wastewater C treatment plant was dried, ground and pre-treated with 1% H2O2 to improve the biosorption capacity. The powdered waste sludge (PWS) was sieved to different mesh sizes and used for biosorption of zinc(II) ions from aqueous solution. Kinetics of zinc biosorption onto PWS was investigated by using the PWS samples with particle size of 64 μm. The pseudo-first and -second order rate expressions were used to correlate the experimental data. The kinetic constants were determined for both models and the second order rate expression was found to be more suitable. Three different biosorption isotherms were used to correlate the equilibrium biosorption data and the isotherm constants were determined. The Langmuir isotherm was found to fit the experimental data better than the other isotherms tested. Maximum biosorption capacity was found to be 82 mg Zn g PAS-1. High biosorption capacity and low saturation constant of pre-treated PWS used for zinc ion biosorption makes the adsorbent more attractive as compared to other alternatives. (c) 2005 Elsevier Inc. All rights reserved.

Keywords: Biosorption, Isotherms, Kinetics, Powdered Waste Sludge (PWS), Zinc(II) Ions, Heavy-Metal Biosorption, Activated-Sludge, Removal, Biomass, Copper, Chromium(VI), Sorption

? Iqbal, M. and Saeed, A. (2006), Entrapment of fungal hyphae in structural fibrous network of papaya wood to produce a unique biosorbent for the removal of heavy metals. *Enzyme and Microbial Technology*, **39** (5), 996-1001.

Full Text: [2006\Enz Mic Tec39, 996.pdf](2006/Enz%20Mic%20Tec39,%20996.pdf)

Abstract: A unique biosorbent was developed by entrapping fungal hyphae in structural fibrous network of papaya wood (SFNPW) and successfully used for the removal of Zn(II) from aqueous solution. The SFNPW-immobilized fungal biosorbent removed Zn(II) rapidly and efficiently with maximum metal removal capacity of 66.17 mg/g dry biomass at equilibrium, 41.93% higher than the amount of Zn(II) removed by free biomass (46.62 mg/g) under the identical conditions. Equilibrium was established in 1 h and biosorption was well defined by Langmuir isotherm model. SFNPW-immobilized fungal biosorbent was regenerated by washing with 50 mM HCl, with upto 99% recovery of the sorbed metal ions and the regenerated system was reused in five adsorption-desorption cycles without any significant loss in its biosorption capacity. The efficient metal removing ability of this unique biosorbent system, low cost of SFNPW and simplicity of the immobilization technique used to produce the SFNPW-immobilized fungal biosorbent system indicate the potential application of this biosorbent for the treatment of wastewaters containing heavy metals. (c) 2006 Elsevier Inc. All rights reserved.

Keywords: Adsorption*,* Alginate*,* Biosorption*,* Biosorption*,* Cadmium*, Carica Papaya*, Cell Immobilization*,* Effluent*,* Immobilization*,* Kinetics*,* Papaya*,* Papaya Wood*,* Phanerochaete Chrysosporium*,* Support*,* Waste Biomass*,* Zinc*,* Zinc(II)

? López, M.J., Guisado, G., Vargas-Garcia, M.C., Suárez-Estrella, F. and Moreno, J. (2006), Decolorization of industrial dyes by ligninolytic microorganisms isolated from composting environment. *Enzyme and Microbial Technology*, **40** (1), 42-45.

Full Text: [2006\Enz Mic Tec40, 42.pdf](2006/Enz%20Mic%20Tec40,%2042.pdf)

Abstract: The decolorization of Remazol Brilliant Blue R (RBBR), Poly R-478 and Poly S-119 by fungi and bacteria isolated from composting piles and the relationship of this ability to other ligninolytic activity tests was analyzed. Poly S-119 decolorizing capability was the most widespread among all tested microorganisms, followed by poly R-478, with RBBR being the most difficult to decolorize. Decolorizing ability was strongly correlated to ligninase production according to Sundman test. However, no relationship was found between this capability and laccase, tyrosinase, oxidase, polyphenoloxidase or peroxidase activities. Three mesophile fungi, one thermophile fungus, and one bacterium were able to significantly decolorize all the dyes. The mesophile fungi had the higher decolorization efficiency with more than 95% for Poly R-478 and Poly S-119 and more than 50% for RBBR. The thermophile fungus decolorized 12, 14 and 40% of Poly R-478, RBBR and Poly S-119, respectively, and the bacterium decolorized 24, 45 and 96% of Poly R-478, RBBR and Poly S-119, respectively. This is the first report of non-filamentous aerobic bacteria showing dye decolorization in axenic culture. These microorganisms can be potential candidates for use in biodecolorization processes. (c) 2006 Elsevier Inc. All rights reserved.

Keywords: Bioremediation, Dye Decolorization, Polymeric Dyes, Ligninolytic, Microbial-Degradation, Abilities

? Aksu, Z., Kilic, N.K., Ertugrul, S. and Donmez, G. (2007), Inhibitory effects of chromium(VI) and Remazol Black B on chromium(VI) and dyestuff removals by *Trametes versicolor*. *Enzyme and Microbial Technology*, **40** (5), 1167-1174.

Full Text: [2007\Enz Mic Tec40, 1167.pdf](2007/Enz%20Mic%20Tec40,%201167.pdf)

Abstract: Many dye-bearing wastewaters also contain heavy metal ions. Although the decolorization of single reactive dye or the uptake of single heavy metal ions by various growing cells has been extensively studied, very little attention has been given to the simultaneous bioremoval of reactive dye-metal ion systems. In this study, the single and combined effects of chromium(VI) and Remazol Black B reactive dye on the chrormuni(VI) and dye removal properties of adapted Trametes versicolor, a white-rot fungus, was investigated in a batch system at different levels of chromium(VI) and dye. Removal studies were performed at an initial pH of 4.0. Chromium(VI) uptake studies were carried out in two different growth media; mainly containing glucose and reduced quantity of glucose and whey. As the maximum microbial chrorniurn(VI) uptake was accomplished in glucose + whey medium, single dye and binary dye-chromiurn(VI) bioremoval studies were also performed in this culture medium. Although the single removal of chromium(VI) and dye was enhanced with increasing initial concentration of each component up to 30 mg l(-1) for chromium(VI) and up to 400 mg l(-1) for dye, in general the presence of increasing concentrations of chromium(VI) ions much more severely inhibited the dye bioremoval by T versicolor. While single chromium(VI) uptake efficiency was 32.2% in 30 mg l(-1) chromium(VI) containing growth medium and single dye removal percent was 77.0% in 400 mg l(-1) dye-bearing growth medium, the fungus was only capable of 10.8 and 13.3% removals of chromium(VI) and Remazol Black B dye, respectively, in the growth medium containing the binary mixture of these components at the above concentrations. (c) 2006 Elsevier Inc. All rights reserved.

Keywords: Trametes Versicolor, Bioremoval, Chromium(VI), Remazol Black B, Batch System, White-Rot Fungi, Textile Waste-Water, Phanerochaete-Chrysosporium, Heavy-Metals, Azo Dyes, Environmental-Conditions, Reactive Dye, Decolorization, Yeast, Bioaccumulation

? Pamukoglu, M.Y. and Kargi, F. (2007), Effects of operating parameters on kinetics of copper(II) ion biosorption onto pre-treated powdered waste sludge (PWS). *Enzyme and Microbial Technology*, **42** (1), 76-82.

Full Text: [2007\Enz Mic Tec42, 76.pdf](2007/Enz%20Mic%20Tec42,%2076.pdf)

Abstract: Effects of operating parameters such as pH, temperature, Cu(II) ion and the adsorbent concentrations and particle size on batch biosorption kinetics of copper(II) ions onto pre-treated powdered waste sludge (PWS) were investigated. Pseudo-first and second order kinetics were used for correlation of pre-equilibrium biosorption data and the rate constants were determined. The pseudo-second order kinetics was found to be more suitable for representation of the kinetic data for almost all cases. Kinetic constants increased with increasing pH, temperature and PWS concentration, but decreased with increasing Cu(II) concentrations and the particle size of PWS. The highest rate constants for the pseudo-first and second order kinetics were 0.808 h-1 and 0.0309 (mg/g)-1 h-1, respectively for the smallest particle size of 53 μm. The highest Cu(II) biosorption capacity of 156 mg g-1 was obtained with PWS and Cu(II) concentrations of 0.25 g l-1 and 100 mg l-1 with the smallest particle size (D-p < 53 μm). (C) 2007 Elsevier Inc. All rights reserved.

Keywords: Activated-Sludge, Adsorbent, Batch, Batch Biosorption, Biosorption, Biosorption Capacity, Biosorption Kinetics, Capacity, Chromium(VI), Concentration, Concentrations, Constants, Copper(II), Copper(II) Ions, Correlation, Cu(II), Cu(II) Ions, DEC, Heavy-Metals, Ion, Ions, Kinetic, Kinetics, L(1), Operating Conditions, Order, Parameters, Particle, Particle Size, pH, Powdered Waste Sludge (PWS), Pretreated, Pseudo Second Order, Pseudo Second Order Kinetics, Pseudo-First And, Pseudo-Second Order, Pseudo-Second Order Kinetics, Pseudo-Second-Order, Rate, Rate Constants, Removal, Representation, Second Order, Second Order Kinetics, Size, Sludge, Sorption, Temperature, Waste, Waste Sludge

# Title: Epidemiologia e Psichiatria Sociale

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? Bignami, G., De Girolamo, G., Fava, G.A., Gaston, A., Morosini, P.L., Pasquini, P., Pastore, V. and Tansella, M. (2000), The impact on the international literature of the scientific production of Italian researchers in the disciplines “psychiatry” and “psychology”. A bibliometric evaluation. *Epidemiologia e Psichiatria Sociale*, **9** (1), 11-25.

Full Text: [2000\Epi Psi Soc9, 11.pdf](2000/Epi%20Psi%20Soc9,%2011.pdf)

Abstract: OBJECTIVE: The aim of the study was to present the results of a citation analysis concerned with the impact of Italian researchers and institutions in psychiatry and psychology upon the international scientific community. METHOD: The analysis has been performed using a database of the Institute for Scientific Information (ISI): All scientific papers which were published between 1981 and 1998 in psychiatric and psychological journals included in the Science Citation Index (SCI) and the Social Sciences Citation Index (SSCI) were considered. The most cited Italian papers, authors and institutions are reported, as well the most frequently utilised journals. RESULTS: Publications concerned with neuropsychology, psychopharmacology and biological psychiatry were the most cited. This prevalence also affected the ranking of the most cited authors, even though, in this case, research groups in disciplines such as clinical psychology and epidemiological psychiatry appeared to be strong. The four most productive Italian Universities were characterized by the presence of both a School of Medicine and a School of Psychology. The Journal of Neurology, Neurosurgery and Psychiatry and Psychopharmacology were the most frequent vehicles of scientific communication. CONCLUSIONS: The results entail important implications for Italian research in psychology and psychiatry. On a general level, these analyses appear to be helpful for monitoring scientific production by granting agencies and for comparing different individual researchers. On a more specific level the analysis has identified the leading trends in research of Italian psychiatry and psychology.

Keywords: Analyses, Analysis, Bibliometric, Biological, Citation, Citation Analysis, Clinical, Clinical Psychology, Communication, Community, Database, General, Impact, Institute for Scientific Information, Institutions, International, ISI, Journals, Literature, Monitoring, Papers, Prevalence, Psychiatry, Psychology, Ranking, Research, SCI, Science Citation Index, Scientific Communication, Scientific Production, SSCI, Trends

? Tansella, M. and Fava, G.A. (2001), Monitoring the impact on international literature of scientific production of Italian researchers, in the disciplines of “psychiatry” and “psychology.” The period of 1995-1999 compared with the period of 1985-1989. *Epidemiologia e Psichiatria Sociale*, **10** (4), 276-282.

Full Text: 2001\Epi Psi Soc10, 276.pdf

Abstract: AIM: The aim of this paper is to present the results of a citation analysis concerned with the impact on the international literature of Italian researchers in psychiatry and psychology and of sub-fields, within these two disciplines, in 1995-1999 compared to 1985-1989. METHOD: We used a database prepared by the Institute for Scientific Information (ISI) that included all papers, with at least one Italian author, working in Italy, which appeared in two periods (1995-1999 and 1985-1989) in psychiatric or psychological journals listed in Current Contents. A citation analysis concerning the following years, up to 1999, was performed. RESULTS: In 1995-1999 the most cited researchers were those involved in clinical psychology, psychiatry and psychopharmacology research. Neuropsychology, which dominated the period 1985-1989, underwent a clear-cut decline. CONCLUSIONS: Citation analysis, concerning relatively short periods of time (five years), appears to be a very helpful tool for monitoring the development of scientific research in specific disciplines and the trend of the scientific production of researchers.

Keywords: Analysis, Citation, Citation Analysis, Clinical, Clinical Psychology, Database, Development, Impact, Institute for Scientific Information, International, ISI, Italy, Journals, Literature, Monitoring, Papers, Psychiatry, Psychology, Research, Scientific Production, Scientific Research, Trend

? Wilkinson, G. (2003), Editing the *British Journal of Psychiatry*. *Epidemiologia e Psichiatria Sociale*, **12** (1), 5-8.

Full Text: [2003\Epi Psi Soc12, 5.pdf](2003/Epi%20Psi%20Soc12,%205.pdf)

? Tyrer, P. (2007), Implications of changes in the impact factors of psychiatric journals. *Epidemiologia e Psichiatria Sociale*, **16** (1), 71-72.

Full Text: 2007\Epi Psi Soc16, 71.pdf

Keywords: Changes, Impact, Impact Factors, Journals

? Galeazzi, G.M. and Priebe, S. (2007), Italian social psychiatry research: What gets published in peer reviewed journals? *Epidemiologia e Psichiatria Sociale*, **16** (3), 212-224.

Full Text: [2007\Epi Psi Soc16, 212.pdf](2007/Epi%20Psi%20Soc16,%20212.pdf)

Abstract: Aims - To explore the current state of Italian social psychiatry research as evidenced by original papers published in peer-reviewed journals 2004-2006. Methods - Electronic databases and hand searches of leading peer-reviewed journals were used to identify original research papers published in 2004-2006, addressing a social psychiatric issue, having at least one Italian author, and reporting data from Italian samples. Results - A total of 174 papers were identified. A substantial proportion reported findings of international collaborative research. Quantitative methods dominated, with 86 papers on cross-sectional surveys. Only 18 papers showed results of intervention trials with pre and post measures. Most common target group were psychiatric patients in community mental health services which featured in 93 papers. Conclusions - There is a critical mass of Italian social psychiatry research, dominated by a few research centres and with considerable amount of international collaboration. The findings of this survey might reflect the relative shortage of national funding for social psychiatry research.

Keywords: 6 European Countries, Bibliometrics, Collaboration, Family Psychoeducational Interventions, Follow-Up, German-Speaking Countries, Italy, Long-Term Diseases, Mental Health, Mental-Health-Services, National-Survey, Quality-of-Life, Randomized Controlled-Trial, Residential Facilities, Social Psychiatry

# Title: Epidemiologic Reviews

Full Journal Title: Epidemiologic Reviews

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? Breiman, R.F. (1996), Impact of technology on the emergence of infectious diseases. *Epidemiologic Reviews*, **18** (1), 4-9.

Full Text: [1996\Epi Rev18, 4.pdf](1996/Epi%20Rev18,%204.pdf)

Abstract: Not all new threats from microorganisms result from changes within the microorganisms themselves. Innovative, progressive changes introduced by humans can provide advantages to microbes which, in turn, threaten the population. In most cases, advantages are provided unwittingly as a by-product of technology, and can be corrected when the problem is recognized. An end to progress is neither a practical nor desirable solution. Alertness (i.e., surveillance) for the emergence of new diseases and to changes in disease patterns will continue to be critical to ensure timely implementation of public health measures.

Keywords: Bacterium *Legionella*-*Pneumophila*, Legionnaires-Disease, United-States, Mycobacterium-Avium, Evaporative Condenser, Massive Outbreak, Water, Epidemiology, Atlanta, Complex

? Marx, A. and Neutra, R.R. (1997), Magnesium in drinking water and ischemic heart disease. *Epidemiologic Reviews*, **19** (2), 258-272.

Full Text: [1997\Epi Rev19, 258.pdf](1997/Epi%20Rev19,%20258.pdf)

Abstract: The associations found in the general populations of a number of different countries are suggestive and warrant an integrated program of laboratory and epidemiologic research to reject or confirm the magnesium-IHD hypothesis. Singling out this particular risk factor has two justifications. First, as would be the case with any epidemiologic risk factor for IHD whose attributable risk was large enough to be detectable through epidemiology, applying that attributable risk to the vast annual morbidity and mortality from IHD would translate into tens of thousands of lives benefited and millions of dollars in hospital costs avoided per year. Second, this particular risk factor could conceivably be eliminated by an inexpensive supplementation program. For example, a low-sodium, higher-magnesium and-potassium table salt has been recommended and used in Finland for many years, during a period when the prevalence of hypertension in population surveys was said to decrease (117). Interventions which do not require behavioral change have always been the most cost-effective in public health. We therefore urge funding agencies to give priority to studies determining whether there are unforeseen adverse effects of magnesium for some population subgroups and whether the apparent benefit derived from low doses of magnesium in the development of IHD or IHD death is real. Furthermore, researchers should determine which chemical form of magnesium is best absorbed and most effective. We need to better understand the interrelation of various water and food constituents, as well as individual risk factors, in the pathogenesis of IHD. Susceptible individuals who are at higher risk of being depleted of magnesium need to be identified, and potential untoward effects of magnesium should be studied. Future research must provide better answers about low level waterborne magnesium before recommendations to the public can be made.

? Papas, M.A., Alberg, A.J., Ewing, R., Helzlsouer, K.J., Gary, T.L. and Klassen, A.C. (2007), The built environment and obesity. *Epidemiologic Reviews*, **29** (1), 129-143.

Full Text: [2007\Epi Rev29, 129.pdf](2007/Epi%20Rev29,%20129.pdf)

Abstract: Obesity results from a complex interaction between diet, physical activity, and the environment. The built environment encompasses a range of physical and social elements that make up the structure of a community and may influence obesity. This review summarizes existing empirical research relating the built environment to obesity. The MEDLINE, PsychInfo, and Web of Science databases were searched using the keywords “obesity” or “overweight” and “neighborhood” or “built environment” or “environment.” The search was restricted to English-language articles conducted in human populations between 1966 and 2007. To meet inclusion criteria, articles had to 1) have a direct measure of body weight and 2) have an objective measure of the built environment. A total of 1,506 abstracts were obtained, and 20 articles met the inclusion criteria. Most articles (84%) reported a statistically significant positive association between some aspect of the built environment and obesity. Several methodological issues were of concern, including the inconsistency of measurements of the built environment across studies, the cross-sectional design of most investigations, and the focus on aspects of either diet or physical activity but not both. Given the importance of the physical and social contexts of individual behavior and the limited success of individual-based interventions in long-term obesity prevention, more research on the impact of the built environment on obesity is needed.

Keywords: African-Americans, Atherosclerosis Risk, Body Weight, Body-Mass Index, Brisbane Food, Databases, Environment, Environment Design, Fast-Food Restaurants, Human, Impact, Interventions, Multilevel Analysis, Obesity, Physical Activity, Physical-Activity, Prevention, Purchase Fresh Fruit, Research, Residence Characteristics, Review, Science, Social, Social Environment, Success, United-States, Urban Sprawl, Web of Science

? Kim, D. (2008), Blues from the neighborhood? Neighborhood characteristics and depression. *Epidemiologic Reviews*, **30** (1), 101-117.

Full Text: [2008\Epi Rev30, 101.pdf](2008/Epi%20Rev30,%20101.pdf)

Abstract: Unipolar major depression ranks among the leading contributors to the global burden of disease. Although established risk factors for depression include a variety of individual-level characteristics, neighborhood etiologic factors have been relatively understudied, with several such attributes (neighborhood socioeconomic status, physical conditions, services/amenities, social capital, social disorder) possessing plausible linkages to depression. Using the PubMed database (1966-2008) and the Social Sciences Citation Index database (1956-2008), the author undertook a systematic review of the published literature on the associations between these characteristics and depression in adults. Across studies, the evidence generally supports harmful effects of social disorder and, to a lesser extent, suggests protective effects for neighborhood socioeconomic status. Few investigations have explored the relations for neighborhood physical conditions, services/amenities, and social capital, and less consistently point to salutary effects. The unsupportive findings may be attributed to the lack of representative studies within and across societies or to methodological gaps, including lack of control for other neighborhood/non-neighborhood exposures and lack of implementation of more rigorous methodological approaches. Establishing mediating pathways and effect-modifying factors will vitally advance understanding of neighborhood effects on depression. Overall, addressing these gaps will help to identify what specific neighborhood features matter for depression, how, and for whom, and will contribute to curtailing the burden of disease associated with this major disorder.

Keywords: African-Americans, Built Environment, Citation, Depression, Environment, Life Events, Literature, Low-Income, Mental-Health, Multilevel Analysis, Residence Characteristics, Risk-Factors, Self-Rated Health, Social Class, Social Conditions, Social Environment, Social Sciences, Socioeconomic Factors, Urban Neighborhoods

? Senese, L.C., Almeida, N.D., Fath, A.K., Smith, B.T. and Loucks, E.B. (2009), Associations between childhood socioeconomic position and adulthood obesity. *Epidemiologic Reviews*, **31** (1), 21-51.

Full Text: [2009\Epi Rev31, 21.pdf](2009/Epi%20Rev31,%2021.pdf)

Abstract: Childhood socioeconomic position (SEP) is inversely associated with cardiovascular disease and all-cause mortality. Obesity in adulthood may be a biologic mechanism. Objectives were to systematically review literature published between 1998 and 2008 that examined associations of childhood SEP with adulthood obesity. Five databases (Cochrane Library, MEDLINE, EMBASE, PsycINFO, Web of Science) were searched for studies from any country, in any language. Forty-eight publications based on 30 studies were identified. In age-adjusted analyses, inverse associations were found between childhood SEP and adulthood obesity in 70% (14 of 20) of studies in females and 27% (4 of 15) in males. In studies of females showing inverse associations between childhood SEP and adulthood obesity, typical effect sizes in age-adjusted analyses for the difference in body mass index between the highest and lowest SEP were 1.0-2.0 kg/m(2); for males, effect sizes were typically 0.2-0.5 kg/m(2). Analyses adjusted for age and adult SEP showed inverse associations in 47% (8 of 17) of studies in females and 14% (2 of 14) of studies in males. When other covariates were additionally adjusted for, inverse associations were found in 4 of 12 studies in females and 2 of 8 studies in males; effect sizes were typically reduced compared with analyses adjusted for age only. In summary, the findings suggest that childhood SEP is inversely related to adulthood obesity in females and not associated in males after adjustment for age. Adulthood SEP and other obesity risk factors may be the mechanisms responsible for the observed associations between childhood SEP and adulthood obesity.

Keywords: Abdominal Obesity, Aberdeen Children, Adult, Body Mass Index, Body-Mass Index, British Womens Heart, Cardiovascular, Cardiovascular Disease, Cardiovascular Risk-Factors, Cause-Specific Mortality, Child, Cochrane, Databases, Disease, Embase, Health Status Disparities, Life-Course Origins, Literature, Mechanism, Medline, Mortality, National Birth Cohort, Obesity, Publications, Review, Review Literature, Risk, Risk Factors, Science, Social Class, Social-Class, Socioeconomic, Socioeconomic Factors, Web of Science, Weight-Gain

? Sentenac, M., Arnaud, C., Gavin, A., Molcho, M., Gabhainn, S.N. and Godeau, E. (2012), Peer victimization among school-aged children with chronic conditions. *Epidemiologic Reviews*, **34** (1), 120-128.

Full Text: [2012\Epi Rev34, 120.pdf](2012/Epi%20Rev34,%20120.pdf)

Abstract: Peer victimization is a common problem among school-aged children, and those with chronic conditions are at an increased risk. A systematic review of the literature was carried out to explore the increased risk of peer victimization among children with chronic conditions compared with others, considering a variety of chronic conditions; and to assess intervention programs designed to reduce negative attitudes or peer victimization at school toward children with chronic conditions. Various data sources were used (PubMed, ERIC, PsycINFO, Web of Science), and 59 studies published between 1991 and 2011 and mainly carried out in North American and European countries were included in the review. A higher level of peer victimization among children with chronic conditions was shown for each type of condition explored in this review (psychiatric diagnoses, learning difficulties, physical and motor impairments, chronic illnesses, and overweight). Despite a substantial number of studies having shown a significant association between chronic conditions and peer victimization, intervention studies aiming to reduce bullying among these children were rarely evaluated. The findings of this review suggest a growing need to develop and implement specific interventions targeted at reducing peer victimization among children with chronic conditions.

Keywords: Adolescent, Adolescents, Association, Attitudes, Bullying, Bullying Victimization, Cerebral-Palsy, Child, Children, Chronic Disease, Chronic Illnesses, Deficit-Hyperactivity Disorder, Disabilities, Disabled Children, Health, Health-Care Needs, Improving Attitudes, Intervention, Intervention Studies, Interventions, Learning, Learning-Difficulties, Literature, Overweight, Pubmed, Review, Risk, Science, Social-Adjustment, Students, Systematic, Systematic Review, Web of Science, Web-of-Science

# Title: Epidemiology

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? Hopenhayn Rich, C., Biggs, M.L., Fuchs, A., Bergoglio, R., Tello, E.E., Nicolli, H. and Smith, A.H. (1996), Bladder cancer mortality associated with arsenic in drinking water in Argentina. *Epidemiology*, **7** (2), 117-124.

Full Text: [1996\Epidemiology7, 117.pdf](1996/Epidemiology7,%20117.pdf)

Abstract: Inorganic arsenic (In-As) is known to be a human carcinogen, causing lung cancer by inhalation and skin cancer by ingestion. Ecologic studies in Taiwan have found a dose-response relation between ingestion of In-As from drinking water and bladder cancer, but questions have been raised concerning the validity and generalizability of the findings. Several areas of Argentina have had high exposures to arsenic from naturally contaminated drinking water, particularly the eastern region of the province of Córdoba. In this study, we investigated bladder cancer mortality for the years 1986-1991 in Córdoba’s 26 counties, using rates for all of Argentina as the standard for comparison. Bladder cancer standardized mortality ratios (SMRs) were consistently higher in counties with documented arsenic exposure. We grouped counties into low-, medium-, and high-exposure categories, the corresponding SMRs [with 95% confidence intervals (CI)] were 0.80 (95% CI = 0.66-0.96), 1.42 (95% CI = 1.14-1.74), and 2.14 (95% CI = 1.78-2.53) for men, and 1.21 (95% CI = 0.85-1.64), 1.58 (95% CI = 1.01-2.35), and 1.82 (95% CI = 1.19-2.64) for women. The clear trends found in a population with different genetic composition and a high-protein diet support the findings in Taiwan.

Keywords: Argentina, Arsenic, Bladder Neoplasms, Water Pollutants, Gender, Internal Cancers, Contamination, Ingestion

? Guo, H.R., Chiang, H.S., Hu, H., Lipsitz, S.R. and Monson, R.R. (1997), Arsenic in drinking water and incidence of urinary cancers. *Epidemiology*, **8** (5), 545-550.

Full Text: [1997\Epidemiology8, 545.pdf](1997/Epidemiology8,%20545.pdf)

Abstract: The associations between arsenic ingestion and cancers of the bladder and kidney have been documented in Taiwan. To evaluate further such associations for urinary cancers of various cell types, we conducted an ecologic study encompassing 243 townships using cancer registry data of patients diagnosed between 1980 and 1987. We used the proportions of wells with various specified arsenic levels in each township as indicators of exposure and evaluated the effects of urbanization and smoking by an urbanization index and the number of cigarettes sold per capita. In both genders, we observed associations of high arsenic levels in drinking water with transitional cell carcinomas of the bladder, kidney, and ureter and all urethral cancers combined. We also observed such associations in adenocarcinomas of the bladder in males, but not in squamous cell carcinomas of the bladder or renal cell carcinomas or nephroblastomas of the kidney. There was also a positive association between the urbanization index and transitional cell carcinomas of the ureter in males. The number of cigarettes sold per capita was not a good predictor for urinary cancers. The results indicate that the carcinogenicity of arsenic may be cell type specific

Keywords: Arsenic, Drinking Water, Cancer, Urinary System, Urbanization, Cigarette Smoking, Ecologic Study, Histologic Subtypes, Essential Trace-Elements, Well Water, Malignant Neoplasms, Respiratory Cancer, Bladder-Cancer, Copper Smelter, Exposure, Mortality, Taiwan, Workers

? Schwartz, J., Levin, R. and Hodge, K. (1997), Drinking water turbidity and pediatric hospital use for gastrointestinal illness in Philadelphia. *Epidemiology*, **8** (6), 615-620.

Full Text: [1997\Epidemiology8, 615.pdf](1997/Epidemiology8,%20615.pdf)

Abstract: Recent outbreaks have demonstrated that serious infectious gastrointestinal illness related to drinking water supplies remains a problem in the United States. The magnitude is unknown, but children, the elderly, and immunocompromised individuals are considered at highest risk. We examined the association between daily measures of drinking water turbidity and both emergency visits and admissions to Children’s Hospital of Philadelphia for gastrointestinal illness, controlling for time trends, seasonal patterns, and temperature. We found that an interquartile range increase in turbidity levels in Philadelphia drinking water was associated with a 9.9% increase [95% confidence limits (CL) = 2.9%, 17.3%] in gastrointestinal emergency visits for children age 3 years and older 4 days later. For children age 2 years and younger, an association was found with a lag of 10 days (5.9% increase, 95% CL = 0.2, 12.0). For admissions, a similar pattern was seen. For children over 2 years old, an increase of 31.1% (95% CL = 10.8%, 55%) was seen with a lag of 5-6 days. For younger children, an increase of 13.1% (95% CL = 3.0, 24.3) was seen 13 days later. This association occurred in a filtered water supply in compliance with current federal standards.

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Full Text: [1997\Epidemiology8, 658.pdf](1997/Epidemiology8,%20658.pdf)

Abstract: We conducted a population-based case-control study among different ethnic groups in Hawaii to evaluate the role of various types and components of fiber, as well as micronutrients and foods of plant origin, on the risk of colorectal cancer. We administered personal interviews to 698 male and 494 female Japanese, Caucasian, Filipino, Hawaiian, and Chinese cases diagnosed during 1987-1991 with adenocarcinoma of the colon or rectum and to 1, 192 population controls matched to cases by age, sex, and ethnicity. We used conditional logistic regression to estimate odds ratios, adjusted for caloric intake and other covariates. We found a strong, dose dependent, inverse association in both sexes with fiber intake measured as crude fiber, dietary fiber, or nonstarch polysaccharides. We found inverse associations of similar magnitude for the soluble and insoluble fiber fractions and for cellulose and noncellulosic polysaccharides. This protective effect of fiber was limited to fiber from vegetable sources, with an odds ratio of 0.6 (95% confidence interval = 0.4-0.9) and 0.5 (95% confidence interval = 0.3-0.7) for the highest compared with the lowest quartile of intake for men and women, respectively. We found associations of the same magnitude for soluble and insoluble vegetable fiber, but no clear association with fiber from fruits or cereals. This pattern was consistent between sexes, across segments of the large bowel (right colon, left colon, and rectum), and among most ethnic groups.

The effect of vegetable fiber may be independent of the effects of other phytochemicals, since the effect estimates remained unchanged after further adjustment for other nutrients. Intakes of carotenoids, light green vegetables, yellow-orange vegetables, broccoli, corn, carrots, bananas, garlic, and legumes (including **soy** products) were inversely associated with risk, even after adjustment for vegetable fiber. The data support a protective role of fiber from vegetables against **colorectal** **cancer**, which appears independent of its water solubility property and of the effects of other phytochemicals. The data also indicate that certain vegetables and fruits may be protective against this disease through mechanisms other than their fiber content.

Keywords: Colorectal Cancer, Diet, Ethnic Groups, Fiber, Fruits, Vegetables, Colo-Rectal Cancer, Large-Bowel-Cancer, Western New-York, Nonstarch Polysaccharides, 7th-Day Adventists, Physical-Activity, History Method, Vegetables, Food, Consumption

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Full Text: [1998\Epidemiology9, 228.pdf](1998/Epidemiology9,%20228.pdf)

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Full Text: [1998\Epidemiology9, 484.pdf](1998/Epidemiology9,%20484.pdf)

Abstract: Exposure during pregnancy to disinfection by-products in drinking water has been hypothesized to lead to several adverse reproductive outcomes. We performed a retrospective cohort study to examine the relation of trihalomethane exposure during the third trimester of pregnancy to low birthweight, term low birthweight, and preterm delivery. We matched Colorado birth certificates from January 1,, (1990), through December 31, (1993), to historical water sample data with respect to time and location of maternal residence based on census block groups. After excluding births from all census block groups with no trihalomethane sample data and restricting to singleton white births with 28-42 weeks of completed gestation (>400 gm), we studied 1, 893 livebirths within 28 census block groups. We found a weak association of trihalomethane exposure during the third trimester with low birthweight (odds ratio = 2.1 for the highest exposure level, 95% confidence interval = 1.0-4.8), a large increase in risk for term low birthweight at the highest level of exposure (odds ratio = 5.9, 95% confidence interval = 2.0-17.0), and no association between exposure and preterm delivery (odds ratio = 1.0 for the highest exposure level, 95% confidence interval = 0.3-2.8). The small number of adverse outcomes reduced the precision of risk estimates, but these data indicate a potentially important relation between third trimester exposure to trihalomethanes and retarded fetal growth.

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Full Text: [1999\Epidemiology10, 86.pdf](1999/Epidemiology10,%2086.pdf)

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Full Text: [1999\Epidemiology10, 513.pdf](1999/Epidemiology10,%20513.pdf)

Abstract: Chlorination of drinking water that contains organic compounds leads to the formation of by-products, some of which have been shown to have mutagenic or carcinogenic effects. As yet, too little is known about the possible teratogenic effects on the human fetus. We linked the Norwegian waterwork registry, containing 1994 data on chlorination practice and color (an indicator for natural organic matter), with the Medical Birth Registry for 1993-(1995). The proportion of the population exposed to chlorination and a weighted mean color number in drinking water was computed for each municipality. Among 141, 077 births, 2,608 (1.8%) had birth defects. In a comparison between exposed (high color, chlorination) and reference groups (low color, no chlorination), the adjusted odds ratio was 1.14 (0.99-1.31) for any malformation, 1.26 (0.61-2.62) for neural tube defects, and 1.99 (1.10-3.57) for urinary tract defects. This study provides further evidence of the role of chlorination of humic water as a potential cause of birth defects, in a country with relatively low levels of chlorination byproducts.

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Full Text: [1999\Epidemiology10, 606.pdf](1999/Epidemiology10,%20606.pdf)

Abstract: We present a framework to aggregate divergent health impacts associated with different types of environmental exposures, such as air pollution, residential noise, and large technologic risks. From the policy maker’s point of view, there are at least three good reasons for this type of aggregation comparative risk evaluation (for example, setting priorities), evaluation of the efficiency of environmental policies in terms of health gain, and characterizing health risk associated with geographical accumulation of multiple environmental exposures. The proposed impact measure integrates three important dimensions of public health: life expectancy, quality of life, and number of people affected. Time is the unit of measurement. “Healthy life years” are either lost by premature death or by loss of quality of life, measured as discounted life years within a population. Severity weights (0 for perfect health, 1 for death) are assigned to discount the time spent with conditions associated with environmental exposures. We combined information on population exposure distribution, exposure response relations, incidence, and prevalence rates to estimate annual numbers of people affected and the duration of the condition, including premature death. Using data from the fourth Dutch National Environmental Outlook, we estimated that the longterm effects of particulate air pollution account for almost 60% of the total environment-related health loss in the Netherlands as modeled here. Environmental noise accounts for 24%, indoor air pollution (environmental tobacco smoke, radon, and dampness, as well as lead in drinking water) for around 6%, and food poisoning (or infection) for more than 3%. The contribution of this see of environmental exposures to the total annual burden of disease in the Netherlands is less than 5%.

? Smith, A., Lopipero, P., Chung, J., Haque, R., Hernandez, A., Moore, L. and Steinmaus, C. (2000), Arsenic in drinking water and cancer risks estimated from epidemiological studies in Argentina, Chile, Taiwan and Japan. *Epidemiology*, **11** (4), 593.

Full Text: 2000\Epidemiology11, 593.pdf

Abstract: We calculated cancer risks from arsenic in drinking water based on studies in Taiwan nearly ten years ago and found that the risk of dying from cancer associated with drinking water containing 50 µg/L might be on the order of 1 in 100 exposed (Smith AH et al, Cancer risks from arsenic in drinking water. Environ Health Perspect 97:259–267, 1992). Since then, we have conducted studies in Argentina and Chile which provide additional causal evidence concerning cancers caused by arsenic in drinking water. These studies show that at high levels of arsenic in water (approximately 500 µg/L) arsenic may eventually cause death due to cancer, mainly of the lung and bladder, in 1 in 10 persons exposed. In this paper we use results from these epidemiological studies to again estimate cancer risks extrapolated down to the current US arsenic drinking water standard of 50 µg/L. Combining information from studies in four countries indicates that the risks of lung cancer alone associated with drinking water containing 50 µg/L may be on the order of 1 in100. Combining cancer risks from each major site, including lung, bladder and skin, suggests that overall cancer risks would exceed 1 in 100. These high environmental cancer risks call for further epidemiological studies, especially of lung cancer, at lower exposures in the range of 50 to 100 µg/L, a range in which increased lung cancer risks might be epidemiologically detectable.

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Full Text: [2000\Epidemiology11, 598.pdf](2000/Epidemiology11,%20598.pdf)

Abstract: We investigated the trends in age-standardized rates (per 100,000 persons-years) of unintentional injury deaths in adult Finns from 1971-1997. In 1971, the leading category of unintentional injury resulting in death among Finnish men was road traffic accidents (age-standardized death rate 47 per 100,000 person-years). This rate has declined sharply, reaching 13 per 100,000 person-years in 1997. Simultaneously, the rate of fall-induced death among men gradually increased from 17/100,000 person-years in 1971 to 21/100,000 person-years in 1997. In 1997 the death rate from falls in men was greater than that of any other category of injury. In 1971, traffic caused fewer deaths in women (rate 17/100,000 person-years) than men, and declined from there to a rate of 6/100,000 person-years in 1997. Concurrently the rate of fall-induced deaths in women also decreased, from 27/100,000 person years in 1971 to 17/100,000 person-years in 1997. Falling, however, was the leading cause of injury related death in 1997, Thus, in the period 1971-1997, falls replaced road traffic accidents as the leading cause of unintentional injury death in Finland.

Keywords: Falls, Injury Induced Deaths, Secular Trends, Traffic Accidents, Prevention, Fractures

? Ferreccio, C., González, C., Milosavjlevic, V., Marshall, G., Sancha, A.M. and Smith, A.H. (2000), Lung cancer and arsenic concentrations in drinking water in Chile. *Epidemiology*, **11** (6), 673-679.

Full Text: [2000\Epidemiology11, 673.pdf](2000/Epidemiology11,%20673.pdf)

Abstract: Cities in northern Chile had arsenic concentrations of 860 µg/liter in drinking water in the period 1958-1970. Concentrations have since been reduced to 40 µg/liter. We investigated the relation between lung cancer and arsenic in drinking water in northern Chile in a case control study involving patients diagnosed with lung cancer between 1994 and 1996 and frequency-matched hospital controls. The study identified 152 lung cancer cases and 419 controls. Participants were interviewed regarding drinking water sources, cigarette smoking, and other variables. Logistic regression analysis revealed a clear trend in lung cancer odds ratios and 95% confidence intervals (CIs) with increasing concentration of arsenic in drinking water, as follows: 1, 1.6 (95% CI = 0.5-5.3), 3.9 (95% CI = 1.2-12.3), 5.2 (95% CI = 2.3-11.7), and 8.9 (95% CI = 4.0-19.6), for arsenic concentrations ranging from less than 10 µg/liter to a 65-year average concentration of 200-400 µg/liter. There was evidence of synergy between cigarette smoking and ingestion of arsenic in drinking water, the odds ratio for lung cancer was 32.0 (95% CI = 7.2-198.0) among smokers exposed to more than 200 µg/liter of arsenic in drinking water (lifetime average) compared with nonsmokers exposed to less than 50 µg/liter. This study provides strong evidence that ingestion of inorganic arsenic is associated with human lung cancer.

Keywords: Arsenic, Lung Cancer, Water Pollutants, Smoking, Synergy, Case-Control Study, Environmental Epidemiology, Disease Endemic Area, Artesian Well Water, Malignant Neoplasms, Blackfoot Disease, Internal Cancers, Mortality, Bladder, Taiwan, Exposure, Kidney

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Full Text: [2004\Epidemiology15, 125.pdf](2004/Epidemiology15,%20125.pdf)

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Full Text: 2006\Epidemiology17, 89.pdf

Abstract: Background: Microsomal epoxide hydrolase 1 (EPHX1) plays an important role in both the activation and detoxification of tobacco-derived carcinogens. Polymorphisms at exons 3 and 4 of the EPHX1 gene have been reported to be associated with variations in EPHX1 activity. The aim of this study is to review and summarize the available molecular epidemiologic studies of lung cancer and EPHX1. Methods: We searched MEDLINE, Current Contents, and Web of Science databases for studies published before August 2004. We conducted a systematic review and meta-analysis of 13 case-control studies. Summary odds ratios and summary prevalence of the variant allele (genotype) of both polymorphisms in the EPHX1 gene were calculated using the DerSimonian and Laird method. Results: The low-activity (variant) genotype of EPHX1 polymorphism at exon 3 was associated with decreased risk of lung cancer (odds ratio = 0.65; 95% confidence interval = 0.44-0.96) in lung cancer risk among whites. In white populations, the high-activity (variant) genotype of EPHX1 polymorphism at exon 4 was associated with a modest increase in risk of lung cancer (1.22; 0.79-1.90) and the predicted low activity was associated with a modest decrease in risk (0.72; 0.43-1.22). Conclusions: EPHX1 enzyme may act as a phase I enzyme in lung carcinogenesis. The low-activity genotype of EPHX1 gene is associated with decreased risk of lung cancer among whites.

Keywords: Biotransformation Enzymes, Cancer, Carcinogenesis, Case-Control Studies, Databases, Epidemiologic Studies, Genetic Polymorphisms, Glutathione-S-Transferase, Lung Cancer, Medline, Meta-Analysis, Methods, Microsomal Epoxide Hydrolase, Molecular, Obstructive Pulmonary-Disease, Ovarian-Cancer, Polymorphism, Polymorphisms, Prevalence, Ratio, Review, Risk, Science, Single Nucleotide Polymorphisms, Squamous-Cell Carcinoma, Systematic, Systematic Review, TYR113HIS Polymorphism, Web of Science, Xenobiotic-Metabolizing Enzymes

? Porta, M. and Álvarez-Dardet, C. (2008), How come scientists uncritically adopt and embody Thomson’s bibliographic impact factor? *Epidemiology*, **19** (3), 370-371.

Full Text: [2008\Epidemiology19, 370.pdf](2008/Epidemiology19,%20370.pdf)

Abstract: The bibliographic impact factor (13117) of Thomson Scientific is sometimes not a valid scientometric indicator for a number of reasons. One major reason is the strong influence of the number of “source items” or “articles” for each journal that the company chooses each year as BIF’s denominator. The irresistible fascination with (and picturesque uses of) a construct as scientifically weak as BIF are simple reminders that scientists are embedded in and embody culture.

Keywords: Impact, Impact Factor, Journals

? Testa, J. (2009), A response from Thomson Reuters. *Epidemiology*, **20** (3), 319-320.

Full Text: [2009\Epidemiology20, 319.pdf](2009/Epidemiology20,%20319.pdf)

# Title: Epidemiology and Infection

Full Journal Title: [Epidemiology and Infection](http://journals.cambridge.org/action/displayJournal?jid=HYG); [Epidemiology and Infection](http://www.jstor.org/action/showPublication?journalCode=epidinfe)

ISO Abbreviated Title: Epidemiol. Infect.

JCR Abbreviated Title: Epidemiol Infect

ISSN: 0950-2688

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Journal Country/Territory: England

Language: English

Publisher: Cambridge Univ Press

Publisher Address: 40 West 20th Street, New York, NY 10011-4211

Subject Categories:

Public, Environmental & Occupational Health: Impact Factor 1.462, 33/88 (2001)

Infectious Diseases: Impact Factor 1.462, 23/37 (2001)

? Hunter, P.R. and Burge, S.H. (1987), The bacteriological quality of bottled natural mineral waters. *Epidemiology and Infection*, **99** (2), 439-443.

Full Text: [1987\Epi Inf99, 439.pdf](1987/Epi%20Inf99,%20439.pdf)

? Mawer, S.L. (1988), *Campylobacter*s in man and the environment in Hull and East Yorkshire. *Epidemiology and Infection*, **101** (2), 287-294.

Full Text: [1988\Epi Inf101, 287.pdf](1988/Epi%20Inf101,%20287.pdf)

Abstract: *Campylobacter* organisms isolated from water samples taken weekly from ponds and land-drains in the City of Hull were compared with isolates from humans. of 314 *Campylobacter* organisms isolated from patients, 237 (75.5%) of the strains were identified as typical *Campylobacter* jejuni, whilst of 125 identified strains isolated from the water samples, 85 (68%) resembled C. jejuni in most respects but were hippurate hydrolysis negative by the Hwang and Ederer method. The ponds and land drains in the city were therefore not a source of *Campylobacter*iosis in the people living near these water courses. The atypical C. jejuni strains isolated from the environment may be mistaken for the C. jejuni strains which cause human infection. It is therefore essential that such strains are fully identified before attributing human and animal infections to their ingestion.

? West, P.A. (1989), The human pathogenic vibrios: A public health update with environmental perspectives. *Epidemiology and Infection*, **103** (1), 1-34.

Full Text: [1989\Epi Inf103, 1.pdf](1989/Epi%20Inf103,%201.pdf)

Abstract: Pathogenic Vibrio species are naturally-occurring bacteria in freshwater and saline aquatic environments. Counts of free-living bacteria in water are generally less than required to induce disease. Increases in number of organisms towards an infective dose can occur as water temperatures rise seasonally followed by growth and concentration of bacteria on higher animals, such as chitinous plankton, or accumulation by shellfish and seafood. Pathogenic Vibrio species must elaborate a series of virulence factors to elicit disease in humans. Activities which predispose diarrhoeal and extraintestinal infections include ingestion of seafood and shellfish and occupational or recreational exposure to natural aquatic environments, especially those above 20°C. Travel to areas endemic for diseases due to pathogenic Vibrio species may be associated with infections. Host risk factors strongly associated with infections are lack of gastric acid and liver disorders. Involvement of pathogenic Vibrio species in cases of diarrhoea should be suspected especially if infection is associated with ingestion of seafood or shellfish, raw or undercooked, in the previous 72 h. Vibrio species should be suspected in any acute infection associated with wounds sustained or exposed in the marine or estuarine environment. Laboratories serving coastal areas where infection due to pathogenic Vibrio species are most likely to occur should consider routine use of TCBS agar and other detection regimens for culture of Vibrio species from faeces, blood and samples from wound and ear infections.

? Gray, S.J. and Stickler, D.J. (1989), Some observations on the faecal carriage of mesophilic Aeromonas species in cows and pigs. *Epidemiology and Infection*, **103** (3), 523-537.

Full Text: [1989\Epi Inf103, 523.pdf](1989/Epi%20Inf103,%20523.pdf)

Abstract: Replicate faecal samples from healthy individual pigs and cows were examined for the presence of Aeromonas sp. over a 12-month period. Aeromonads were found to be minor components of the faecal flora, only 8.8% of 520 samples from pigs and 4.6% of 481 samples from cows proving positive. Isolation rates in both groups of animals were seasonal. A hydrophila (62% of the isolates) was the predominant species in cows, followed by A. caviae (32%) and A. sobria (15%). This pattern was also recorded in the natural waters that the animals drank from during the period when the faecal carriage rate was at its highest. In pigs, A. caviae (59%) was more common than A. hydrophila (41%). A. sobria was not found in any of the pig-associated samples. It seems that cattle acquire their faecal aeromonads from drinking water. The source of the organisms in pigs is less clear.

? Gray, S.J., Stickler, D.J. and Bryant, T.N. (1990), The incidence of virulence factors in mesophilic Aeromonas species isolated from farm animals and their environment. *Epidemiology and Infection*, **105** (2), 277-294.

Full Text: [1990\Epi Inf105, 277.pdf](1990/Epi%20Inf105,%20277.pdf)

Abstract: Sixty-one isolates of Aeromonas spp. from the faeces of pigs, cows and a variety of associated environmental sources were examined for the characteristics that are reputed to have roles in pathogenicity. Most isolates of Aeromonas hydrophila were cytotoxic (96.4%) and were capable of producing cell elongation factor (75%) and haemagglutinins (67.9%). In contrast few of the Aeromonas caviae isolates produced these three markers (13.6%, 27.3% and 36.4% respectively). In general, Aeromonas sobria occupied an intermediate position (36.4%, 27.3% and 54.5%), but they did produce the highest mean invasion index for HEp-2 cells. Statistical analysis revealed significant associations between the carriage of these factors and it was clear that many isolates of aeromonads from water and animals possessed the full battery of putative virulence factors.

? Kapperud, G., Skjerve, E., Vik, L., Hauge, K., Lysaker, A., Aalmen, I., Ostroff, S.M. and Potter, M. (1993), Epidemiological investigation of risk factors for *Campylobacter* colonization in Norwegian broiler flocks. *Epidemiology and Infection*, **111** (2), 245-255.

Full Text: [1993\Epi Inf111, 245.pdf](1993/Epi%20Inf111,%20245.pdf)

Abstract: An epidemiological investigation was conducted to identify risk factors related to hygiene and husbandry practices which determine the introduction of *Campylobacter* spp. into broiler chicken flocks. All 176 broiler farms in an area in southeastern Norway participated in the study. Each farm was represented by one flock selected at random during a one-year period. The flocks were examined for *Campylobacter* colonization at slaughter, and the flock managers were subsequently interviewed about hygiene and husbandry practices. *Campylobacter* spp. were recovered from 32 (18%) of the flocks. The proportion of colonized flocks varied geographically and seasonally with a peak in the autumn. The following variables were found to be independently associated with an increased risk of *Campylobacter* colonization using logistic regression analysis: (i) feeding the broilers undisinfected water (odds ratio (OR) = 3.42, P = 0.045), (II) tending other poultry prior to entering the broiler house (OR = 6.43, P = 0.007), (iii) tending pigs before entering the house (OR = 4.86, P = 0.037), (iv) geographic region (Hedmark versus Ostfold county) (OR = 2.91, P = 0.023, (v) season (autumn versus other seasons) (OR = 3.43, P = 0.008). Presence of rats on the farm was associated with an increased risk, but this factor did not reach statistical significance (OR = 3.96, P = 0.083). Preventive measures should include disinfection of drinking water and strict hygienic routines when the farm workers enter the rearing room. The results indicate that disinfection of drinking water is the preventive measure most likely to have the greatest impact on the prevalence of *Campylobacter* among broiler chicken flocks in the study area (population attributable fraction = 0.53).

? Lee, S.H., Lai, S.T., Lai, J.Y. and Leung, N.K. (1996), Resurgence of cholera in Hong Kong. *Epidemiology and Infection*, **117** (1), 43-49.

Full Text: [1996\Epi Inf117, 43.pdf](1996/Epi%20Inf117,%2043.pdf)

Abstract: Cholera is one of the three diseases subject to the International Health Regulations. After a period of over 30 years, the seventh pandemic of cholera, which started in South East Asia in 1961, still shows no sign of a decline. On the contrary, it has increased its severity and invaded many other countries in Africa and Latin America. In the last two years, there has been a recrudescence of the disease in South East Asia and Western Pacific Regions. The discovery of a new strain of *Vibrio cholerae* 0139 in these regions is causing concern in view of its potential to cause major epidemics and higher mortality. Hong Kong had two intensive outbreaks of cholera in the last two years. The cause of these outbreaks was not clear, but adverse environmental conditions and increasing pollution of coastal waters have been implicated. The spread of cholera knows no geographical boundaries. There is a need for intensified efforts among health authorities in the affected areas to prevent the international spread of the disease.

? Furtado, C., Adak, G.K., Stuart, J.M., Wall, P.G., Evans, H.S. and Casemore, D.P. (1998), Outbreaks of waterborne infectious intestinal disease in England and Wales, 1992-5. *Epidemiology and Infection*, **121** (1), 109-119.

Full Text: [1998\Epi Inf121, 109.pdf](1998/Epi%20Inf121,%20109.pdf)

Abstract: Following the introduction of an improved surveillance system for infectious intestinal disease outbreaks in England and Wales, the Public Health Laboratory Service Communicable Disease Surveillance Centre received reports of 26 outbreaks between 1 January 1992 and 31 December, (1995), in which there was evidence for waterborne transmission of infection. In these 26 outbreaks, 1756 laboratory confirmed cases were identified of whom 69 (4%) were admitted to hospital. In 19 outbreaks, illness was associated with the consumption of drinking water from public supplies (10 outbreaks) or private supplies (9 outbreaks). The largest outbreak consisted of 575 cases. In 4 of the remaining 7 outbreaks, illness was associated with exposure to swimming pool water. *Cryptosporidium* was identified as the probable causative organism in all 14 outbreaks associated with public water supplies and swimming pools. *Campylobacter* was responsible for most outbreaks associated with private water supplies. This review confirms a continuing risk of cryptosporidiosis from chlorinated water supplies in England and Wales, and reinforces governmental advice to water utilities that water treatment processes should be rigorously applied to ensure effective particle removal. High standards of surveillance are important for prompt recognition of outbreaks and institution of control measures. As microbiological evidence of water contamination may be absent or insufficient to implicate a particular water supply, a high standard of epidemiological investigation is recommended in all outbreaks of suspected waterborne disease.

? Frost, F.J., Muller, T., Craun, G.F., Calderon, R.L. and Roefer, P.A. (2001), Paired city *Cryptosporidium* serosurvey in the southwest USA. *Epidemiology and Infection*, **126** (2), 301-307.

Full Text: [2001\Epi Inf126, 301.pdf](2001/Epi%20Inf126,%20301.pdf)

Abstract: In 1996, serological responses to two *Cryptosporidium* antigens were determined for 200 Las Vegas (LV), Nevada, and 200 Albuquerque, New Mexico, blood donors to evaluate associations between endemic infections, water exposures, and other risk factors. LV uses chlorinated filtered drinking water from Lake Mead while Albuquerque uses chlorinated ground water. The intensity of serological response to both markers was higher for older donors (P < 0.05), donors who washed food with bottled water (P < 0.05) and donors from LV (P < 0.05). A decreased serological response was not associated with bottled water consumption, nor was an increased response associated with self-reported cryptosporidiosis-like illness or residence in LV at the time of a cryptosporidiosis outbreak 2 years earlier. Although these findings suggest the serological response may be associated with type of tap water and certain foods, additional research is needed to clarify the role of both food and drinking water in endemic *Cryptosporidium* infection.

Keywords: Serologic Response, Antibody, Outbreak

? Puech, M.C., McAnulty, J.M., Lesjak, M., Shaw, N., Heron, L. and Watson, J.M. (2001), A statewide outbreak of cryptosporidiosis in New South Wales associated with swimming at public pools. *Epidemiology and Infection*, **126** (3), 389-396.

Full Text: [2001\Epi Inf126, 389.pdf](2001/Epi%20Inf126,%20389.pdf)

Abstract: From December 1997 to April 1998, 1060 laboratory-confirmed cryptosporidiosis cases were reported in New South Wales, Australia. In a case-control study, compared with 200 controls, the 100 cases were younger (mean age 4(.)2 versus 7(.)1 years, P < 0(.)0001), more likely to report swimming at a public pool (59% versus 38%, adjusted OR and 95% CI = 2(.)7, 1(.)4-5(.)1) and swimming in a dam, river or lake (OR = 4(.)8, 1(.)1-20(.)3) but less likely to report drinking bottled water (OR = 0(.)4, 0(.)2-0(.)9). In subgroup analyses, in rural areas illness was associated mainly with contact with another person with diarrhoea, and in urban areas illness was associated with swimming in a public pool. *Cryptosporidium* oocysts were more commonly detected in pools to which at least two notified cases had swum (P = 0(.)04). Outbreaks of cryptosporidiosis can be prolonged, involve multiple pools and be difficult to control.

Keywords: Community, Parvum, Transmission, Surveillance, Infection

# Title: Epilepsia

Full Journal Title: Epilepsia

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Fisher, R.S. and Powers, L.E. (2004), Peer-reviewed publication: A view from inside. *Epilepsia*, **45** (8), 889-894.

Full Text: [E\Epilepsia45, 889.pdf](E/Epilepsia45,%20889.pdf)

# Title: Epilepsy & Behavior

Full Journal Title: Epilepsy & Behavior

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Fiszman, A., Alves-Leon, S.V., Nunes, R.G., D’Andrea, I. and Figueira, I. (2004), Traumatic events and posttraumatic stress disorder in patients with psychogenic nonepileptic seizures: A critical review. *Epilepsy & Behavior*, **5** (6), 818-825.

Abstract: Although video-EEG monitoring has revolutionized the diagnosis of psychogenic nonepileptic seizure (PINES), the etiology of this condition remains poorly understood. This article is a critical review of studies on the prevalence of traumatic events, abuse, and/or posttraumatic stress disorder (PTSD) in patients with PINES. Searches carried out on MEDLINE (1966-2004) and Web of Science (1945-2004) identified 17 relevant studies. PINES samples showed very high rates of trauma (44-100%) and abuse (23-77%), which were 15-40% higher than those found in control groups. This suggests that traumatic experiences may be a potential risk factor for PINES. PINES samples also showed a higher prevalence of PTSD than control groups, raising the possibility that PINES may arise as a clinical expression of a hypothetical PTSD subtype the core symptoms of which are dissociative. Methodological limitations do not permit the confirmation of these hypotheses. Stronger research designs are needed, such as prospective and case-control studies in both hospital and community settings. (C) 2004 Elsevier Inc. All rights reserved.

Keywords: Case-Control Studies, Childhood, Clinical-Features, Control, Control Groups, Diagnosis, Disorder, Dissociation, Dissociative Disorders, Epilepsy, Etiology, Follow-up, Hospital, Hysterical Seizures, Medline, Monitoring, Nonepileptic Seizures, Pine, Posttraumatic Stress, Posttraumatic Stress Disorder, Predictors, Prevalence, Pseudoseizures, PTSD, Research, Review, Risk, Science, Stress, Survivors, Symptoms, Trauma, Traumatic Events, Web of Science

# Title: Epilepsy Research

Full Journal Title: Epilepsy Research

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Lim, Y.J., Chan, S.Y. and Ko, Y. (2009), Stigma and health-related quality of life in Asian adults with epilepsy. *Epilepsy Research*, **87** (2-3), 107-119.

Full Text: [2009\Epi Res87, 107.pdf](2009/Epi%20Res87,%20107.pdf)

Abstract: This study aims to (1) review the impact of epilepsy on the health-related quality of life (HRQoL) of Asian adult persons with epilepsy (PWE), and (2) identify the extent of stigma they experience and the associated factors. The electronic databases MEDLINE, PsycINFO, ISI Web of Science, and the International Pharmaceutical Abstracts were searched using a combination of keywords to identify relevant journal articles published before October 2007, and supplemental manual searches of article bibliographies and the journal Neurology Asia were conducted. Thirty-six articles that met the predetermined inclusion criteria were selected and reviewed. The HRQoL of Asian adult PWE was lower than that of the general population. These PWE had difficulties in both physical and psychosocial functioning. Psychosocial factors appeared to have a more significant impact on PWE’s HRQoL than physical factors. Stigma and negative attitudes towards marriage and employment of PWE was prevalent in many Asian countries, and the stigma’s associated factors were multifaceted. Given the prevalent negative attitudes towards epilepsy, public education campaigns targeting misconceptions and associated factors may help reduce stigma and, together with psychosocial support, the HRQoL of Asian adult PWE can be improved. (C) 2009 Elsevier B.V. All rights reserved.

Keywords: Adult, Adults, Antiepileptic Drugs, Asia, Attitudes, Databases, Education, Employment, Epidemiology, Epilepsy, Health-Related Quality of Life, Hong-Kong, Impact, ISI, Journal, Knowledge, People, Psychosocial, Psychosocial Adjustment, Public Awareness, Quality of Life, Review, Science, Seizure Frequency, South-Korea, Stigma, Web of Science

? Xi, B., Chen, J., Yang, L., Wang, W.Y., Fu, M.S. and Wang, C.Y. (2011), *GABBR1* gene polymorphism(G1465A)isassociated with temporal lobe epilepsy. *Epilepsy Research*, **96** (1-2), 58-63.

Full Text: [2011\Epi Res96, 58.pdf](2011/Epi%20Res96,%2058.pdf)

Abstract: Purpose: gamma-Aminobutyric acid B receptor 1(GABBR1) gene G1465A polymorphism has been considered as a potential risk factor for the development of temporal lobe epilepsy (TLE). However, the results were inconsistent. In this study, we performed a meta-analysis to assess the association between GABBR1 G1465A polymorphism and the risk of TLE. Methods: Biomedical literature databases including PubMed, 151 web of science and Embase were searched. The studies evaluating the association between GABBR1 G1465A polymorphism and TLE were included. Pooled odds ratio (OR) and 95%CI confidence interval (CI) were calculated using fixed- or random-effects model. Key findings: Seven studies (1011 cases and 2184 controls) met the inclusion criteria and were included in the meta-analysis. The overall result showed that the association between GABBR1 G1465A polymorphism was statistically significant (OR = 5.381, 95%CI: 1.726, 16.776, P=0.004). Subgroup analysis showed that the effect estimate was higher in the studies with high quality score (OR = 14.220, 95%CI: 6.933, 29.169, P=0.000) than that in the studies with low quality score (OR = 1.158, 95%CI: 0.325, 4.123, P=0.821). Significance: The present meta-analysis suggests that GABBR1 G1465A polymorphism is associated with the risk of TLE. The role of GABBR1 G1465A polymorphism in the development of TLE merits further investigation. (C) 2011 Elsevier B.V. All rights reserved.

Keywords: Acid, Analysis, Association, Bias, Chinese Population, Databases, Development, Epidemiology, Gaba(B)R1, Gabbr1, Literature, Meta Analysis, Meta-Analysis, Metaanalysis, Methods, Mice, Model, Polymorphism, Pubmed, Ratio, Receptor-1 Polymorphism G1465a, Risk, Risk Factor, Science, Temporal Lobe Epilepsy, Web of Science

# Title: EPL

Full Journal Title: [EPL](http://www.iop.org/EJ/journal/0295-5075)

ISO Abbreviated Title:

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ISSN: 0295-5075

Issues/Year:

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Subject Categories:

: Impact Factor

? Schreiber, M. (2007), Self-citation corrections for the Hirsch index. *Epl*, **78** (3), 30002.

Full Text: [2007\Epl78, 30002.pdf](2007/Epl78,%2030002.pdf)

Abstract: I propose to sharpen the index h, suggested by Hirsch as a useful index to characterize the scientific output of a researcher, by excluding the self-citations. Performing a self-experiment and also discussing in detail two anonymous data sets, it is shown that self-citations can significantly reduce the h index in contrast to Hirsch’s expectations. This result is confirmed by an analysis of 13 further data sets. Copyright (C) EPLA, 2007.

Keywords: Analysis, Anonymous, h Index, h-Index, Hirsch Index, Index h, Ranking, Scientific Output, Scientists, Self-Citations

# Title: E-Polymers

Full Journal Title: [E-Polymers](http://www.e-polymers.org/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1618-7229

Issues/Year:

Journal Country/Territory:

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Publisher Address:

Subject Categories:

: Impact Factor

? Yiğitoğlu, M. and Arslan, M. (2007), Adsorption behaviour of methylene blue from aqueous solution on poly(ethylene terephthalate)-g-4-vinylpyridine/2-hydroxyethylmethacrylate fibers. *E-Polymers*, Art. No. 055 MAY 25.

Full Text: [2007\E-Polymers2007, 055.pdf](2007/E-Polymers2007,%20055.pdf)

Abstract: In this study, a novel fibrous adsorbent obtained by grafting 4-vinyl pyridine (4-VP)/2-hydroxyethylmethacrylate (HEMA) comonomers onto poly (ethylene terephthalate) (PET) fibers was used for removal of methylene blue (MB) from aqueous solutions through a batch equilibration technique. The Influence of treatment time, pH of the solution, dye concentration, reaction temperature and percent graft yield on adsorbed amount were investigated. 300 min. of adsorption time was found sufficient to reach adsorption equilibrium for MB. It was found that the adsorption isotherm of MB fitted to Langmuir type isotherm. The highest adsorption capacity was found to be 55.33 mg MB per gram adsorbent. The adsorbed amount of MB was much higher on the comonomers grafted PET fibers than on the ungrafted PET fibers. MB was removed by 98 % while the initial dye concentration was at 5 mg L-1 and by 88% at 300 mg L-1 by monomers mixture grafted PET fibers. It was found that the reactive fibers were stable and regenerable by acid without loosing their activity.

Keywords: Low-Cost Adsorbents, Poly(Ethylene-Terephthalate) Fibers, Fe(III)/Cr(III) Hydroxide, Color Removal, Waste-Water, Kinetics, Equilibrium, Biosorption, Sorption, Dyes

? Arslan, M. and Yiğitoğlu, M. (2008), Use of 4-vinylpyridine and 2-hydroxyethylmethacrylate monomer mixture grafted poly(ethylene terephthalate) fibers for removal Of congo red from aqueous solution. *E-Polymers*, Art. No. 016 JAN 29.

Full Text: E-Polymers2008, 016

Abstract: In this study, a novel fibrous adsorbent made by grafting 4-vinyl pyridine (4-VP) and 2-hydroxyethylmethacrylate (HEMA) monomer mixture onto poly(ethylene terephthalate) (PET) fibers was used for removal of Congo red (CR) in aqueous solutions by a batch equilibration technique. The influence of treatment time, pH of solution, dyes concentration, and reaction temperature on adsorbed amount was investigated. Adsorption time of 60 min. was found sufficient to reach adsorption equilibrium for CR. It was found that the adsorption isotherm of CR fits to Langmuir type isotherms. The highest adsorption capacity was found to be 11.87 mg CR per gram adsorbent. The adsorption rate of CR is much higher on the comonomers grafted PET fibers than on the ungrafted PET fibers. CR was removed 97% when the initial dye concentration was 5 mg L-1 and 38% at 150 mg L-1 by monomers mixture grafted PET fibers. The adsorption of the dye was endothermic in nature (ΔH°= 45.3 KJmol-1). It was found that the reactive fibers are stable and regenerate by acid without losing its activity.

Keywords: Methylene-Blue, Color Removal, Waste-Water, Adsorption Behavior, Activated Carbon, Basic-Dyes, Azo-Dye, Decolorization, Equilibrium, Wastewaters

? Chaves, J.A.P., Bezerra, C.W.B., Santana, S.A.A., Schultz, M.S., Silva, H.A.S., Penha, R.S., Vieira, A.P. and de Souza, A.G. (2010), Kinetics and thermodynamics of indanthrene textile dye adsorption onto chitosan. *E-Polymers*, Article Number: 066.

Abstract: The kinetics and equilibrium of Indanthrene Olive Green (IOG) adsorption on chitosan, from aqueous solutions, have been investigated. The chitosan was characterized by XRD, average degree of deacetylation (DD), TGA/DTG, IR, SEM and specific BET surface area. Batch adsorptions experiments were carried out in different pH and dye concentration. An acidic pH condition (4.0 to 6.0) was favorable to the adsorption process. The adsorption followed second-order rate kinetics and the experimental equilibrium data followed Langmuir isotherm, suggesting that chemisorption might be the major adsorption mode. The adsorptions also occurred on chitosan fibers, being significantly lower than that of crushed chitosan. Thermodynamic parameters (ΔGº, ΔHº, and ΔSº) were calculated. The positive values of ΔHº (161.7 kJ mol-1) and ΔSº (559.9 J mol-1 K-1) suggest that the adsorption is endothermic and that during this adsorption process the randomness of the system increases. A simplified adsorption model is also proposed.

Keywords: Acid Dye, Adsorption, Affinity Support, Aqueous Solutions, Aqueous-Solution, BET, BET Surface Area, Chemisorption, Chitosan, Coated Dialdehyde Cellulose, Concentration, Cross-Linked Chitosan, Data, Dried Activated-Sludge, Dye, Dye Adsorption, Endothermic, Equilibrium, Experimental, Experiments, Fibers, IR, Isotherm, Kinetics, Langmuir, Langmuir Isotherm, Low-Cost Adsorbents, Methylene-Blue, Mode, Model, pH, Randomness, Rate Kinetics, Reactive Dyes, Second Order, Second-Order, SEM, Solutions, Surface, Surface Area, Textile Dye, Thermodynamic, Thermodynamic Parameters, Thermodynamics, Urea Nitrogen, XRD

# Title: Equilibria and Dynamics of Gas Adsorption on Heterogeneous Solid Surfaces Studies in Surface Science and Catalysis

Full Journal Title: Equilibria and Dynamics of Gas Adsorption on Heterogeneous Solid Surfaces Studies in Surface Science and Catalysis

ISO Abbreviated Title:

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ISSN: BH38Q

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Pfeifer, P. and Liu, K.Y. (1997), Multilayer adsorption as a tool to investigate the fractal nature of porous adsorbents. *Equilibria and Dynamics of Gas Adsorption on Heterogeneous Solid Surfaces Studies in Surface Science and Catalysis*, **104**, 625-677.

Abstract: This chapter surveys the use of physical adsorption, from a monolayer upward, as an experimental method to study the fractal surface structure found in many porous and irregular adsorbents. The fractal structure leads to power laws of the Frenkel-Halsey-Hill (FHH) type for the adsorption isotherm, with exponents depending on the fractal dimension of the surface and on whether the dominant force is the substrate potential (van der Waals wetting, low coverage) or the film-vapor surface tension (capillary wetting, high coverage). We derive the power laws from a unifying framework which treats the two forces as competing effects and automatically identifies well-defined coexistence lines in the pressure-dimension diagram between the submonolayer regime, the van der Waals wetting regime, and the capillary wetting regime. We compute the resulting phase diagram for several adsorbate/adsorbent pairs, predicting which of the two power laws will be observed in what pressure range for a given surface geometry and adsorbate. A detailed comparison of the adsorption isotherm on a fractal surface with that in a single pore exhibits many parallels and differences between the two, which we also discuss in terms of t-plots and comparison plots. The aim of the presentation is to provide a simple, but complete set of guidelines for the interpretation of experimental adsorption isotherms, with a minimum number of parameters, in a thermodynamically and geometrically consistent way. A variety of recent experimental studies using multilayer adsorption for fractal analysis are reviewed as illustrations. The examples include some important test cases and range from metal films to carbon blacks, activated carbons, carbon fibers, pyrogenic silicas, silica xerogels and aerogels, porous glasses, and cements.

Keywords: Gas-Phase Adsorption, X-Ray-Scattering, Silica Aerogels, Rough Surfaces, Carbon-Blacks, Capillary Condensation, Physical Adsorption, Nitrogen Adsorption, Irregular Surfaces, Noninteger Dimensions

# Title: Ergonomics

Full Journal Title: [Ergonomics](http://weblinks3.epnet.com/authHjafDetail.asp?tb=1&_ua=bo+B%5F+db+buhjnh+bt+TD++%22ERO%22+1B64&_ug=sid+E98D75D4%2D9E13%2D44B6%2DBBAC%2D1B62BC00D548%40sessionmgr2+dbs+buh+5CB4&_us=sm+ES+E6C7&_uso=st%5B0+%2DTD++%22ERO%22+tg%5B0+%2D+db%5B0+%2Dbuh+op%5B0+%2D+h)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

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Abstract: The detection of the electrical signal from human and animal muscle dates from long before L. Galvani who took credit for it. J. Swammerdam had already shown the Duke of Tuscany in 1658 the mechanics of muscular contraction. Even if ‘electrology or localised electrisation’- the original terminology for electromyography (EMG)- contained the oldest biological scientific detection and measuring techniques, EMG remained a ‘supporting’ measurement with limited discriminating use, except in conjunction with other methods. All this changed when EMG became a diagnostic tool for studies of muscle weakness, fatigue, pareses, paralysis, and nerve conduction velocities, lesions of the motor unit or for neurogenic and myogenic problems. In addition to the measurement qualities, the electrical signal could be induced as functional electrical stimulation (FES), which developed as a specific rehabilitation tool. Almost in parallel and within the expanding area of EMG, a speciality developed wherein the aim was to use EMG for the study of muscular function and coordination of muscles in different movements and postures. Kinesiological EMG and therewith surface EMG can be applied in studies of normal muscle function during selected movements and postures, muscle activity in complex sports, occupational and rehabilitation movements, isometric contraction with increasing tension up to the maximal voluntary contraction, evaluation of functional anatomical muscle activity (validation of classical anatomical functions), coordination and synchronization studies (kinematic chain), specificity and efficiency of training methods, fatigue, the relationship between EMG and force, the human-machine interaction, the influence of material on muscle activity, occupational loading in relation to lower back pain and joint kinematics. Within these various applications the recording system (e.g. the signal detection, the volume conduction, signal amplification, impedance and frequency responses, the signal characteristics) and the dataprocessing system (e.g. rectification, linear envelope and normalization methods) go hand in hand with a critical appraisal of choices, limits and possibilities.

Keywords: History and Bibliometry Raw EMG Rectified EMG Surfaceintegrated Electromyography Normalization Detection Hazards

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Abstract: The relationship between research and practice in ergonomics and human factors has rarely been addressed in the literature. This presents specific problems for researchers when seeking to relate their work to the research community. Equally, practitioners are often frustrated by the lack of appropriate research to meet their needs. This paper seeks to identify current drivers for ergonomics research along with an analysis of how these are changing. Specifically, the use of bibliometric data to assess research output and its impact on a multi-disciplinary subject such as ergonomics is examined. Areas where action may be required to stimulate better research and improved practice are proposed. These include a greater role for the practitioner in completing the circle of knowledge and improving the evidence base for practice with, in particular, practitioners becoming more active in determining research priorities. It is concluded that combined effort is needed by researcher and practitioner communities to enable and promote a more effective understanding of the true impact of ergonomics across industry and society. Statement of Relevance:The relationship between ergonomics research and practice is examined. Research ‘drivers’ are identified, including the influence of bibliometric data. Implications for researchers and practitioners are discussed. The role of practitioners in completing the circle of knowledge and improving the ergonomics evidence base is stressed, as is the need to promote the impact of ergonomics across society.

Keywords: Analysis, Bibliometric, Community, Data, Ergonomics Impact, Ergonomics Practice, Ergonomics Research, Evidence, Field, Human, Human Factors, Impact, Knowledge, Literature, Multidisciplinary, Musculoskeletal Disorders, Needs, Practice, Research, Research Priorities, Role, Scientific Journals, Society, The Good, Understanding, Work

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Full Text: [1990\Ess Inf Sci1990, 13, 469.pdf](1990/Ess%20Inf%20Sci1990,%2013,%20469.pdf)

# Title: Estuaries and Coasts

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? Fourqurean, J.W., Duarte, C.M., Kershaw, M.D. and Threlkeld, S.T. (2008), *Estuaries and Coasts* as an outlet for research in coastal ecosystems: A bibliometric study. *Estuaries and Coasts*, **31** (3), 469-476.

Full Text: [2008\Est Coa31, 469.pdf](2008/Est%20Coa31,%20469.pdf)

Abstract: Recent changes in the editorial leadership, name, content, and publishing process for Estuaries and Coasts and looming changes in scientific publishing as technology advances have provided an opportunity to assess the health and examine the growth in size and reputation of the journal. Estuaries and Coasts has grown in size by about fourfold, with a concurrent decline in acceptance rate of about 1.5% per year to reach the present 65% acceptance rate. The number of paper downloads has increased exponentially to the current 4,000 downloads per month. Most (81%) of the published papers come from senior authors in the USA, with only 15% of the papers coming from senior authors based in non-English-speaking countries. The average number of authors per paper increased from an average of two in 1980 to three at present, and the impact factor has risen to 1.563 in 2006, at about the middle of the range in impact factors for related journals, from an average of 1.295 in the previous 10 years. Papers published in Estuaries and Coasts have a long citation half-life (8.4 years), resulting in very few (3.5%) published papers never receiving citations. All metrics assessed portray Estuaries and Coasts as a journal on the rise that stands up in comparisons of quality and citation rate with other journals in its field.

Keywords: Acceptance, Advances, Authors, Bibliometric, Bibliometric Analysis, Bibliometric Study, Changes, Citation, Citations, Coastal, Coastal Ecosystems, Ecosystems, Field, Growth, Half-Life, Health, History of The Journal, Impact, Impact Factor, Impact Factors, Journal, Journals, Leadership, Metrics, Number, Papers, Publication Statistics, Publishing, Quality, Research, Size, Technology, USA

# Title: Estuarine Coastal and Shelf Science

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Jeng, W.L. and Han, B.C. (1996), Coprostanol in a sediment core from the anoxic Tan-Shui estuary, Taiwan. *Estuarine Coastal and Shelf Science*, **42** (6), 727-735.

Full Text: [E\Est Coa She Sci42, 727.pdf](E/Est%20Coa%20She%20Sci42,%20727.pdf)

Abstract: A short sediment core with a length of approximately 40 cm taken from the anoxic Tan-Shui estuary, Taiwan, was analysed for extractable and bound coprostanol (5 beta-cholestan-3 beta-ol), cholestanol (5 alpha-cholestan-3 beta-ol) and cholesterol (cholest-5-en-3 beta-ol). Extractable Sigma coprostanol and cholestanol concentrations exhibit an abrupt change at a depth of about 20 cm, which supposedly marks the time when a sewage treatment plant became operational in the estuary in 1980. The Sigma coprostanol/cholesterol and cholestanol/cholesterol ratios are comparatively higher in sediment than in the sewage effluent, implying some degree of diagenesis in the extractable phase. Anoxicity must have played a crucial role in the preservation and diagenesis of the sterols. In the upper layer (c. top 20 cm), the concentrations of extractable Sigma coprostanol, normalized to total organic carbon (TOC), increase down the core. Extractable cholestanol exhibits the same trend, but extractable cholesterol shows the opposite trend. This indicates cholesterol reduction to these two stanols. In addition, both bound Sigma coprostanol/TOC and cholestanol/TOC display a decreasing trend with core depth and no pronounced concentration change at 20 cm depth The averages of percent bound sterols are in the following order: cholesterol > Sigma coprostanol > cholestanol.

Keywords: Coprostanol, Extractable, Bound, Sediment, Diagenesis, Organic-Carbon, Sewage, Geochemistry, Stanols, Indicator, Pollution, Sterols, Markers, Bay

? Wake, H. (2005), Oil refineries: A review of their ecological impacts on the aquatic environment. *Estuarine Coastal and Shelf Science*, **62** (1-2), 131-140.

Full Text: [2005\Est Coa She Sci62, 131.pdf](2005/Est%20Coa%20She%20Sci62,%20131.pdf)

Abstract: Pollution of the aquatic environment occurs from many different sources including from oil refineries. Oil refinery effluents contain many different chemicals at different concentrations including ammonia. sulphides, phenol and hydrocarbons. The exact composition cannot however be generalised as it depends on the refinery and which units are in operation at any specific time. It is therefore difficult to predict what effects the effluent may have on the environment. Toxicity tests have shown that most refinery effluents are toxic but to varying extents. Some species are more sensitive and the toxicity may vary throughout the fife cycle. Sublethal tests have found that not only can the effluents be lethal but also they can often have sublethal effects on growth and reproduction. Field studies have shown that oil refinery effluents often have an impact on the fauna. which is usually restricted to the area close to the outfall. The extent of the effect is dependent on the effluent composition. the outfall’s position and the state of the recipient environment. It is possible to detect two effects that oil refinery effluent has on the environment. Firstly it has a toxic effect close to the outfall, which is seen by the absence of all or most species. Secondly there is an enrichment effect which can be distinguished as a peak in the abundance or biomass. These effects are not limited to just oil refinery effluents. which makes it difficult to distinguish the effects an oil refinery effluent has from other pollution sources. The discharge from oil refineries has reduced in quantity and toxicity over recent decades, allowing many impacted environments in estuaries and coasts to make a substantial recovery. (C) 2004 Elsevier Ltd. All rights reserved.

Keywords: Oil Refinery, Effluent, Petrochemicals, Estuaries, Toxicity, Recovery, Treated Liquid Effluent, Petroleum-Hydrocarbons, Southampton Water, Long-Term, Estuarine Mudflat, Toxicity, Sediments, Sea, Discharges, Macrofauna

# Title: Estudios de Psicología

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? Castro, J. and Jiménez, B. (2004), The Journal *Estudios de Psicología*: An interpretation of its editorial, formal, theoretic and thematic development from a quantitative viewpoint. *Estudios de Psicología*, **25** (3), 229-264.

Full Text: Est Psi25, 229

Abstract: A descriptive study on the journal Estudios de Psicología from its foundation in 1980 up to 2003 was undertaken. After defining the productivity profile around three chronological periods (1980-1986, 19871995, and 1996-2003), we describe four bibliometric studies analysing the editorial line of the journal, the main collaborating authors, the theoretical lines followed by papers, and the thematic fields treated. These studies confirm, from a quantitative point of view, the journal’s special relationship with the development and theoretic analysis taking place in the area of general psychology over the past quarter century, particularly with respect to the study of cognitive processes associated with thought and psycholinguistics. These bibliometric studies also corroborate the weight of universities located in Madrid, in particular, the Universidad Autónoma de Madrid, in establishing its editorial line of work. To end, the paper discusses certain programmatic challenges that the journal should approach in view of current academic and governmental contexts.

Keywords: Bibliometric Analysis, Content Analysis, Cognitivism, Estudios de Psicologia, History of Psychology, General Psychology, Psychology Publications, Psychology In Spain, Analisis Bibliometrico, Analisis de Contenido, Cognitivismo, Estudios de Psicologi, Historia de la Psicologia, Psicologia Basica, Publicaciones de Psicologia, Psicologia Espanola

# Title: Ethics & Behavior

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? Sullivan, L.E. and Ogloff, J.R.P. (1998), Appropriate supervisor graduate student relationships. *Ethics & Behavior*, **8** (3), 229-248.

Full Text: [1998\Eth Beh8, 229.pdf](1998/Eth%20Beh8,%20229.pdf)

Abstract: Given that university faculty members and supervisors practicing in the community have been involved in at least one research supervisor-graduate student relationship, it is surprising that so little attention has been paid to the ethical issues involved in such relationships. Indeed, as a student and her or his graduate research supervisor may be involved in a close working relationship for many years, it is understandable that several opportunities can arise that could be considered dual or multiple relationships. Examples of such relationship issues discussed in this article include authorship matters, favoritism or inequitable treatment of students, and sexual relationships. Depending on the nature of the relationship, the impact on students can be quite severe; although, the effects on students have not been adequately studied. Existing ethical guidelines do not provide enough guidance in this area where students are in a position of diminished power with respect to the supervisor. Following the discussion of relationship issues, we suggest extensions of current guidelines to deal with these issues.

Keywords: Attention, Authorship, Authorship Order, Contact, Educators, Ethics and Teaching, Faculty, Guidelines, Impact, National Survey, Power, Research, Sexual Intimacy, Student Relations, Students, Supervision, Treatment, University, Violations

? Geelhoed, R.J., Phillips, J.C., Fischer, A.R., Shpungin, E. and Gong, Y.J. (2007), Authorship decision making: An empirical investigation. *Ethics & Behavior*, **17** (2), 95-115.

Full Text: [2007\Eth Beh17, 95.pdf](2007/Eth%20Beh17,%2095.pdf)

Abstract: This empirical study concerns the authorship credit decision-making processes and outcomes that occur among coauthors in cases of multiauthored publications. The 2002 American Psychological Association (APA) Ethics Code offers standards for determining authorship order; however, little is known about how these decisions are made in actual practice. Results from a survey of 109 randomly selected authors indicated that most authors were satisfied with the decision-making process and outcome with few disagreements. Participants reported cases of both undeserved authorship being given and omission of deserving contributors’ names as coauthors. Some factors associated with authorship decisions included “sense of loyalty or obligation,” “publish or perish pressures,” and “power differentials.” Authors who used APA standards were significantly more satisfied with both the process and outcome of authorship credit decisions.

Keywords: Assignment, Author Contributions, Authors, Authorship, Authorship Decision Making, Credit, Decision Making, Decision-Making, Ethics, Faculty-Student Collaborations, Issues, Order, Outcome, Outcomes, Practice, Psychological, Psychology, Publications, Satisfaction With Authorship Credit Decisions, Scientist, Standards, Survey

? Jeffery, D.D. and Fries, J. (2011), Unauthorized uses of a coauthored work and a doctoral dissertation. *Ethics & Behavior*, **21** (2), 118-126.

Full Text: 2011\Eth Beh21, 118.pdf

Abstract: This article describes the unauthorized uses of a coauthored work and a copyrighted U.S. dissertation by European scientists. The case involves alleged infringements of copyright and plagiarism in 6 works that were published up to 19 years after completion of the dissertation and up to 11 years after publication of the coauthored work. Relevant copyright laws, international copyright agreements, and professional psychology ethics and definitions of scientific misconduct are presented. Graduate students and professionals are advised to protect themselves from copyright infringement and recognize that the responsibility for detecting and correcting misappropriated work usually lies with them, not journal editors.

Keywords: Allegations, Authorship, Definitions, Duplicate Publication, Ethics, Journal, Journal Editors, Journals, Misconduct, Plagiarism, Professional, Publication, Redundant Publications, Research, Scientific Misconduct, Scientific Misconduct, Students

# Title: Ethics and Information Technology

Full Journal Title: Ethics and Information Technology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Heersmink, R., van den Hoven, J., van Eck, N.J. and van den Berg, J. (2011), Bibliometric mapping of computer and information ethics. *Ethics and Information Technology*, **13** (3), 241-249.

Full Text: [2011\Eth Inf Tec13, 241.pdf](2011/Eth%20Inf%20Tec13,%20241.pdf)

Abstract: This paper presents the first bibliometric mapping analysis of the field of computer and information ethics (C&IE). It provides a map of the relations between 400 key terms in the field. This term map can be used to get an overview of concepts and topics in the field and to identify relations between information and communication technology concepts on the one hand and ethical concepts on the other hand. To produce the term map, a data set of over thousand articles published in leading journals and conference proceedings in the C&IE field was constructed. With the help of various computer algorithms, key terms were identified in the titles and abstracts of the articles and co-occurrence frequencies of these key terms were calculated. Based on the co-occurrence frequencies, the term map was constructed. This was done using a computer program called VOSviewer. The term map provides a visual representation of the C&IE field and, more specifically, of the organization of the field around three main concepts, namely privacy, ethics, and the Internet.

Keywords: Bibliometric, Bibliometric Mapping, Computer and Information Ethics, Ethics, Information, Journals, Overview, Term Map, Vosviewer

# Title: Ethiopian Medical Journal

Full Journal Title: Ethiopian Medical Journal

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Getahun, H. and Yirga, H. (2002), Pattern of articles published in the *Ethiopian Medical Journal*. *Ethiopian Medical Journal*, **40** (4), 315-323.

Abstract: Five Hundred and Thirty Nine articles published between January 1984 and December 2000 in the Ethiopian Medical Journal were analysed to assess the research pattern and the citations of published articles. Hand-in-hand search of the journals and the Science Citation Index database were used Majority (69%) of the articles were original articles. The median number of authors per article was 2 with a range of 9 (Maximum 10 and Minimum 1). Majority of first authors were affiliated to teaching institutions (69.6%). Foreign nationals were first authors in 19.9% and coauthors in 26.7% of the articles. Multiple authored articles [OR (95% CI) 1.17 (1.03-1.33)], original articles [OR (95%CI)= 12.0 (4.43-32.48) and articles dealing with intestinal parasites [OR (95%CI)= 3.88 (1.24-12.08)] were more likely to be cited Although, encouraging efforts were seen in addressing issues of public health importance in the last five years (1996-2000) of the study period, the findings of the study suggest that there is still a need to address them in a more vigorous way. It was also recommended efforts should be initiated to improve the citation of articles published by the Ethiopian Medical Journal and enhance the publication of editorials and brief communications.

Keywords: Citation, Citations, Communications, Database, First, Health, Institutions, Journals, Pattern, Public, Public Health, Publication, Research, Science Citation Index, Teaching

# Title: Etologia

Full Journal Title: Etologia

ISO Abbreviated Title: Etologia

JCR Abbreviated Title: Etologia

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Guillen-Salazar, F. (1992), Trends in applied ethological research: A bibliometric survey of references gathered in Animal Behavior Abstracts (1984-1989). *Etologia*, **2**, 91-97.

Keywords: Bibliometric, Bibliometric Survey, Research, Survey

# Title: ETR&D-Educational Technology Research and Development

Full Journal Title: [ETR&D-Educational Technology Research and Development](http://www.springerlink.com/content/119965/?p=a1124b30d831465a83bf8c03dbbdf803&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Anglin, G.J. and Towers, R.L. (1992), Reference citations in selected instructional-design and technology journals, 1985-1990. *ETR&D-Educational Technology Research and Development*, **40** (1), 40-43.

Full Text: [1992\ETR&D40, 40.pdf](1992/ETR&D40,%2040.pdf)

Abstract: This article reports on a bibliometric research study undertaken to identify authors who are most frequently cited in Educational Technology Research and Development, Educational Communication and Technology journal, and in the journal of Instructional Development. Thirty-seven authors with 20 or more citations over a five-year period were identified and rank- ordered by total number of citations

Keywords: Bibliometric, Citations, Communication, English, Journal, Patterns, Research, Technology

? Kirby, J.A., Hoadley, C.M. and Carr-Chellman, A.A. (2005), Instructional systems design and the learning sciences: A citation analysis. *ETR&D-Educational Technology Research and Development*, **53** (1), 37-48.

Full Text: [2005\ETR&D53, 37.pdf](2005/ETR&D53,%2037.pdf)

Abstract: Learning sciences (LS) and instructional systems design (ISD) are two related fields that have shared interests in the application of technology for advancing human learning. While the two fields may have different values, boundaries, and in some cases methods, they also share significant overlap of content and purpose. We examine the relationship between the two fields through a citation analysis of three journals in each of the respective fields. The findings of the study indicate that the amount of cross-field publication is low, but there exists a trend for increased cross-field citation. As cross-field publication increases, we suggest that the existence of invisible colleges that link the fields will become more salient.

Keywords: Bibliometrics, Citation, Citation Analysis, Frequency, History, Journals, Part II, Publication, Sciences, Scientific Communication, Technology

? Gall, J.E., Ku, H.Y., Gurney, K., Tseng, H.W., Yeh, H.T. and Chen, Q. (2010), Citations of ETR&D and related journals, 1990-2004. *ETR&D-Educational Technology Research and Development*, **58** (3), 343-351.

Full Text: [2010\ETR&D58, 343.pdf](2010/ETR&D58,%20343.pdf)

Abstract: Scientific communication in the field of educational technology was examined by analyzing references from and citations to articles published in Educational Technology Research and Development (ETR&D) for the period 1990-2004 with particular emphasis on other journals found in the citation record. Data were collected on the 369 core articles found in the 60 issues published during that time period, their reference lists (containing over 14,805 individual items), and citations of those articles in other journals (1,896 entries). The top cited and citing journals during that time period are listed. Nine symbiotic journals (i.e. those that are most cited by ETR&D and frequently cite it) were identified: Contemporary Educational Psychology, Educational Psychologist, Instructional Science, Journal of Computer-Based Instruction (no longer published), Journal of Educational Computing Research, Journal of Educational Psychology, Journal of Educational Research, Journal of Research in Science Teaching, and the Review of Educational Research. The results provide an in-depth, quantitative view of informal connections within the field via the citation record. Implications for further research and the potential influence of new technologies on scientific communication are also discussed.

Keywords: Articles, Bibliometrics, Citation, Citation Research, Citations, Core, Journals, Psychology, Quantitative, Research, Review, Scholarship, Science, Scientific Communication, Technology

# Title: Eurasian Soil Science

Full Journal Title: [Eurasian Soil Science](http://www.maik.rssi.ru/cgi-bin/journal.pl?name=soilsci&page=main)

ISO Abbreviated Title: Eurasian Soil Sci.

JCR Abbreviated Title: Eurasian Soil Sci

ISSN: 1064-2293

Issues/Year: 12

Journal Country/Territory: Russia

Language: English

Publisher: Interperiodica

Publisher Address: PO BOX 1831, Birmingham, AL 35201-1831

Subject Categories:

Agriculture, Soil Science: Impact Factor 0.039, 29/29 (2000)

? Ladonin, D.V. (2000), Ion competition in soils polluted by heavy metals. *Eurasian Soil Science*, **33** (10), 1129-1136.

Full Text: Eur Soi Sci33, 1129.pdf

Abstract: The specific sorption of copper, zinc, cadmium, and lead ions by soils from solutions containing all these elements has been studied. It is shown that ion competition causes temporal changes in soil capacity for the retention of particular ions. A redistribution of ions among different soil reaction centers takes place. As a result, the ions of each heavy metal are bound with those reaction centers to which they have the highest affinity.

? Vodyanitskii, Y.N., Rogova, O.B. and Pinskii, D.L. (2000), Application of the Langmuir and Dubinin-Radushkevich equations to the description of Cu and Zn adsorption in rendzinas. *Eurasian Soil Science*, **33** (11), 1226-1233.

Full Text: Eur Soi Sci33, 1226.pdf

Abstract: It is proved that, in a number, of cases the modified Dubinin-Radushkevich equation provides wider means for the description of ion-exchange adsorption of heavy metals by soils as compared to the Langmuir equation. The maximum adsorption of title by soddy-calcareous soil rendzina is relatively low, being equal, on average, to 0.1 mM per 100 g. Zinc is poorly retained by the soil. Copper is adsorbed in greater amounts and is retained better.

? Ivanov, I.V. and Lukovskaya, T.S. (2003), Scientometric (bibliometric) analysis of publications in Pochvovedenie for 100 years (1899-1998). *Eurasian Soil Science*, **36** (1), 107-120.

Full Text: Eur Soi Sci36, 107.pdf

Abstract: A bibliometric analysis of the materials published in Pochvovedenie in the past century (1899-1998) has been performed. The dynamics of the number of contributing authors and the number of published papers, distribution of the authors by the number of published papers, co-authorship, the amount of biographical data (including jubilees and obituaries), and distribution of the authors by countries and organizations are analyzed. The results of this analysis are interpreted from the viewpoints of historical and sociological aspects of the development of Russian soil science.

Keywords: Journal Pochvovedenie, Soil Science, Pages

# Title: European Accounting Review

Full Journal Title: [European Accounting Review](http://web.ebscohost.com.ludwig.lub.lu.se/ehost/detail?vid=1&hid=111&sid=9e2ef870-178f-4d1c-beab-e130d6345c6a%40sessionmgr112&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=bth&jid=5B3)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Carmona, S., Gutierrez, I. and Camara, M. (1999), A profile of European accounting research: Evidence from leading research journals. *European Accounting Review*, **8** (3), 463-480.

Full Text: [E\Eur Acc Rev8, 463.pdf](E/Eur%20Acc%20Rev8,%20463.pdf)

Abstract: This paper attempts both to advance understanding about the research profile of accounting in Europe and to evaluate the role of The European Accounting Review in the dissemination of Europe-based accounting research. Empirical evidence supporting this investigation was gathered from all the papers published in thirteen top accounting journals during the period 1992 to 1997. Our results show that (i) a vast majority of European contributions to well-regarded journals are authored by scholars affiliated to British higher education organizations. Therefore, the overwhelming dominance of British accounting academics over Europe-based accounting research posits considerable doubts on the extent to which it is correct to form the notion of European accounting research. Our results suggest that such a notion is strongly shaped by one constituency of the European setting, that is, by researchers affiliated to British higher education institutions. (II) The European Accounting Review has played a significant role in the diffusion of Europe-based accounting research. The journal constitutes the sole venue providing international visibility to scholars of eleven continental European countries. Moreover, The European Accounting Review has published a significant proportion of contributions from scholars of the other fifteen European countries. (iii) There exists limited mobility of non-English written accounting research across European countries. Lastly, the paper posits some suggestions for further work in this area.

# Title: European Archives of Oto-Rhino-Laryngology

Full Journal Title: [European Archives of Oto-Rhino-Laryngology](http://www.springerlink.com/content/101555/?p=874d5acfb2084638b6fe5a0a4d03d66c&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Remacle, M., Van Haverbeke, C., Eckel, H., Bradley, P., Chevalier, D., Djukic, V., de Vicentiis, M., Friedrich, G., Olofsson, J., Peretti, G., Quer, M. and Werner, J. (2007), Proposal for revision of the European Laryngological Society classification of endoscopic cordectomies. *European Archives of Oto-Rhino-Laryngology*, **264** (5), 499-504.

Full Text: [2007\Eur Arc Oto-Rhi-Lar264, 499.pdf](2007/Eur%20Arc%20Oto-Rhi-Lar264,%20499.pdf)

Abstract: A classification of laryngeal endoscopic cordectomies, which included eight different types, was first proposed by the European Laryngological Society in 2000. The purpose of this proposal of classification was an attempt to reach better consensus amongst clinicians and agree on uniformity in reporting the extent and depth of resection of cordectomy procedures, to allow relevant comparisons within the literature when presenting/publishing the results of surgery, and to recommend the use of guidelines to allow for reproducibility amongst practicing laryngologists. A total of 24 article citations of this classification have been found through the science citation index, as well as 3 book chapters on larynx cancer surgery, confirming its acceptance. However, on reflection, and with the passage of time, lesions originating at the anterior commissure have not been clearly described and, for that reason, a new endoscopic cordectomy (type VI) for cancers of the anterior commissure, which have extended or not to one or both of the vocal folds, without infiltration of the thyroid cartilage is now being proposed by the European Laryngological Society Committee on Nomenclature to revise and complete the initially reported classification.

Keywords: Anterior Commissure, Cancer, Carbon-Dioxide Laser, Citation, Citations, Classification, CO2-Laser Cordectomy, Early Glottic Carcinoma, Endoscopic Cordectomies Classification, European Laryngological Society, Glottic Cancer, Infiltration, Literature, Partial Laryngectomy, Radiotherapy, Science, Science Citation Index, Surgery, Term Follow-up, Voice Quality

? Kulasegarah, J. and Fenton, J.E. (2010), Comparison of the h index with standard bibliometric indicators to rank influential otolaryngologists in Europe and North America. *European Archives of Oto-Rhino-Laryngology*, **267** (3), 455-458.

Full Text: [2010\Eur Arc Oto-Rhi-Lar267, 455.pdf](2010/Eur%20Arc%20Oto-Rhi-Lar267,%20455.pdf)

Abstract: The Hirsch (h) index is an original and simple new bibliometric measure incorporating both quantity and quality. In this study, our aim was first to present characteristics of the statistical correlation between the h index and several standard bibliometric indicators and secondly we compared the h index between otolaryngologists from Europe and US. We used the Institute of Scientific Information (ISI) Web of Knowledge to identify citation reports from a random sample of influential editors from six otolaryngology journals: Journal of Laryngology and Otology (n = 21), Clinical Otolaryngology (n = 16), European Archives of Oto-Rhino-Laryngology (n = 49), The Laryngoscope (n = 66), Otolaryngology-Head and Neck Surgery (n = 15), and Archives of Otolaryngology-Head and Neck Surgery (n = 15). The following data were gathered: Number of publications (P), total citations received by P(C), total citations received by P without self-citations (Cs), average number of citations per publication (CPP), and Hirsch index (h). Statistical analysis was used to correlate the above data and we also compared the h index of European and North American editors. There were 182 randomly selected editors. We observed a good correlation between the h index and other standard bibliometric indicators. Using the non-parametric Mann-Whitney test, the median P between Europe and US was not statistically significant. However, the median C, CS and h were statistically significant. In conclusion, the h index is a simple yet powerful indicator as it combines productivity and impact. Overall, the US editorial panel have a higher h index.

Keywords: Bibliometric, Bibliometric Indicators, Citation, Citations, Europe, h Index, h-Index, Hirsch Index, Impact, ISI, Journals, Otolaryngology, Publication, Publications, Scientists, Self-Citations, Statistical Analysis, Web of Knowledge

? Philpott, C.M., Gane, S. and McKiernan, D. (2011), Nanomedicine in otorhinolaryngology: What does the future hold? *European Archives of Oto-Rhino-Laryngology*, **268** (4), 489-496.

Full Text: [2011\Eur Arc Oto-Rhi-Lar268, 489.pdf](2011/Eur%20Arc%20Oto-Rhi-Lar268,%20489.pdf)

Abstract: Nanotechnology and nanomedicine are new and rapidly developing areas which are concerned with the utilisation of structures and devices, one billionth of a metre in scale and how their special properties may be utilised in the diagnosis and treatment of diseases. In otorhinolaryngology, there have been some inroads into utilising these new treatment modalities and there is future prospect for significant developments. Their impact may be to revolutionise the current practice of otorhinolaryngology. This review considers current developments and future prospects for nanotechnology in our specialty and considers the pitfalls that may be encountered. The online medical reference databases PUBMED, Google Scholar, ISI Web of Science and Science Direct were searched with search terms “Nanotechnology, Nanomedicine” in combination with “Otolaryngology, ENT, Rhinology, Otology, Head and Neck Surgery, Laryngology” in turn. A number of developments are already showing promise in animal models, particularly for nanoparticle delivery of drugs, which may avoid some of the inherent systemic side effects seen with conventional application. Other possibilities include nanoscale reconstruction and regeneration of tissues and even unexpected spin-off technologies such as haemostatic agents. The future treatment of otorhinolaryngological diseases could be revolutionised by advances in nanomedicine and nanotechnology and diseases, such as olfactory disorders may become radically more amenable to medical treatment.

Keywords: Alzheimer-Disease, Amphotericin-B, Anosmia, Cell, Chronic Rhinosinusitis, Databases, Diagnosis, Google Scholar, Impact, Intranasal Zinc, ISI, London Center, Medical, Nanoparticles, Nanotechnology, Parkinson-Disease, Practice, Pubmed, Review, Science, Treatment, Utilisation, Web of Science

# Title: European Archives of Psychiatry and Clinical Neuroscience

Full Journal Title: European Archives of Psychiatry and Clinical Neuroscience

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Falkai, P. (2010), What was new, interesting and frequently cited in 2009? *European Archives of Psychiatry and Clinical Neuroscience*, **260** (2), 87-89

Full Text: [2010\Eur Arc Psy Cli Neu260, 87.pdf](2010/Eur%20Arc%20Psy%20Cli%20Neu260,%2087.pdf)

Keywords: Disease

# Title: European Chemical News

Full Journal Title: European Chemical News

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

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? Hogge, R. (1998), Responsible Care: Progress or just PR? *European Chemical News*, (SS), 10.

# Title: European Child & Adolescent Psychiatry

Full Journal Title: [European Child & Adolescent Psychiatry](http://www.springerlink.com/content/101490/?p=dcc8eaf6b99443b18362ba4dd2d8a8bd&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

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Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? López-Muñoz, F., Alamo, C., Quintero-Gutiérrez, F.J. and García-García, P. (2008), A bibliometric study of international scientific productivity in attention-deficit hyperactivity disorder covering the period 1980-2005. *European Child & Adolescent Psychiatry*, **17** (6), 381-391.

Full Text: [2008\Eur Chi Ado Psy17, 381.pdf](2008/Eur%20Chi%20Ado%20Psy17,%20381.pdf)

Abstract: Objective We have carried out a bibliometric analysis of scientific publications related to attention-deficit hyperactivity disorder (ADHD) and its pharmacological treatment over the period 1980-2005. Method We selected (in EMBASE and MEDLINE databases) documents that contained in their title the descriptors attention deficit hyperactivity disorder, attention deficit disorder, ADHD and ADD. As bibliometric indicators of production and dispersion we applied Price’s Law and Bradford’s Law, respectively. We also calculated the national participation index (PI) and correlated it with overall PI in biomedical and health sciences, with PI in the discipline of Psychiatry and with the social-health indicators (per capita Gross Domestic Product, number of physicians and total per capita expenditure on health). Results We obtained 5,269 original documents (2,325 corresponded to pharmacological therapy). Our results indicate fulfilment of Price’s Law, since scientific production on ADHD undergoes exponential growth (correlation coefficient r = 0.9859, vs. r = 0.9011 after linear adjustment). The most widely studied drugs are methylphenidate (1,251 documents). Division into Bradford zones yields a nucleus occupied exclusively by the Journal of the American Academy of Child and Adolescent Psychiatry (500 articles). A total of 866 different journals were employed. Twelve of the first 20 used journals have an Impact Factor > 2. The principal producer country is the United States (PI = 44.2). Only four countries, of the 20 major producers in health sciences, surpass their own PI in the field of Psychiatry (Brazil, China, Spain and the United States). The correlation between PI and total number of physicians for each country situates Canada, Australia, the United States and Israel in the top positions. Conclusion Productivity on ADHD has undergone exponential growth in the period 1980-2005, without evidence a saturation point.

Keywords: Adhd, Attention-Deficit Hyperactivity Disorder, Bibliometric, Bibliometric Analysis, Bibliometric Indicators, Bibliometric Study, Bibliometry, Brazil, Countries, Databases, Deficit, Hyperactivity Disorder, Descriptors, Growth, Health Sciences, Indicators, Journals, Medline, Methylphenidate, Productivity, Psychostimulants, Psychotropic Medications, Publications, Sciences, Scientific Production, Scientific Productivity, Scientific Publications, Spain, Treatment, Trends

# Title: European Eating Disorders Review

Full Journal Title: European Eating Disorders Review

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Calero-Elvira, A., Krug, I., Davis, K., Lopez, C., Fernandez-Aranda, F. and Treasure, J. (2009), Meta-analysis on drugs in people with eating disorders. *European Eating Disorders Review*, **17** (4), 243-259.

Abstract: Objective: The aim of this study was to examine whether drug use (DU) is higher in people with eating disorders (EDs) compared to a healthy control group and to perform a meta-analysis on the literature related to DU in people with EDs. Method: We searched electronic databases (MEDLINE, PsycINFO, Web of Science and CINAHL) and reviewed studies published from 1994 to August, 2007, in English, German or Spanish. A total of 16 papers fulfilled the inclusion criteria and were included. Results: The general meta-analysis revealed a negligible albeit significant effect size (0.119, p <.05). Risk was found to be higher in bulimia nervosa (BN, delta = 0.462, p = <.001), smaller in binge eating disorder (delta = 0.14, p <.05) and non-significant in anorexia nervosa (AN, delta = -.167, p = .070). Conclusions: The differential risk observed in patients with BN might be related to differences in temperament or might be the result of reward sensitization. Copyright (C) 2009 John Wiley & Sons, Ltd and Eating Disorders Association.

Keywords: Abuse, Alcohol, Anorexia Nervosa, Anorexia-Nervosa, Binge Eating Disorders, Bulimia Nervosa, Bulimia-Nervosa, Comorbidity, Control, Copyright, Databases, Disorder, Drug, Drug Use, Drugs, Female Adolescents, Impulse Control Disorders, Literature, Meta-Analysis, Novelty Seeking, Papers, Risk, Science, Substance Use, Systematic Review, Web of Science, Women

# Title: European Economic Review

Full Journal Title: [European Economic Review](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5804&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=96cfd048dfd9d6bca96f59c214a4efd0) [European Economic Review](http://www.swetswise.com/eAccess/viewTitleIssues.do?titleID=71768)

ISO Abbreviated Title: Eur. Econ. Rev.

JCR Abbreviated Title: Eur Econ Rev

ISSN: 0014-2921

Issues/Year: 7

Journal Country/Territory: Netherlands

Language: English

Publisher: Elsevier Science BV

Publisher Address: PO Box 211, 1000 AE Amsterdam, Netherlands

Subject Categories:

Economics: Impact Factor 0.926, / (2001) SSCI

Flemming, J. (1991), The use of assessments of British university teaching, and especially research, for the allocation of resources: A personal view. *European Economic Review*, **35** (2-3), 612-618.

Full Text: [E\Eur Eco Rev35, 612.pdf](E/Eur%20Eco%20Rev35,%20612.pdf)

Abstract: The paper is in three parts: *1.* Background, demography of student numbers and age distribution of faculty in the 80s and 90s, the dual support system for academic research by the University Grants (Funding) Committee (Council) and Research Councils, the funding formula, Economic and Social Research Council sanctions on departments too few of whose doctoral students submit on time. *2.* UGC/UFC subject reviews and research rating exercises. Criticisms of correlation of assessed quality with departmental scale, difficulties of mixing input and output indices, bibliometrics and the apparent weighting of prestige journals, the role of consultation with learned societies such as the Royal Economic Society. *3.* Incentive issues and their transmission to individuals. The balance between pure and applied research.

# Title: European Food Research and Technology

Full Journal Title: European Food Research and Technology

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Wolman, F.J., Copello, G.J., Mebert, A.M., Targovnik, A.M., Miranda, M.V., del Canizo, A.A.N., Diaz, L.E. and Cascone, O. (2010), Egg white lysozyme purification with a chitin-silica-based affinity chromatographic matrix. *European Food Research and Technology*, **231** (2), 181-188.

Full Text: [2010\Eur Foo Res Tec231, 181.pdf](2010/Eur%20Foo%20Res%20Tec231,%20181.pdf)

Abstract: A composite biosorbent retaining non-covalently bound chitin in between layers of a silicon oxide matrix was assessed for lysozyme purification from undiluted egg white. The matrix can be shaped with big size and high density, thus allowing its efficient separation from the egg white after the adsorption step. The lysozyme-depleted egg white can follow its usual commercialisation route. A surface area of 142 m2/g and a total pore volume of 0.295 cm3/g were calculated from the nitrogen sorption isotherms. Its water content was 78.3%. The matrix structure is the result of the polysaccharide addition to the polymerisation mixture, which is known to influence the condensation process, leading to a material with characteristic properties. A maximum capacity of 117.1±A 9 mg lysozyme/g and a dissociation constant of 0.73±A 0.15 mg/mL were calculated from the Langmuir isotherm. A lysozyme purification batch process from undiluted egg white was developed, where 87% of the lysozyme was removed from the egg white and the matrix was easily recovered by a simple filtration through a strainer. The overall yield of the process was 64% with a purification factor of 20.

Keywords: Adsorption, Batch, Batch Process, Biosorbent, Capacity, Chitin, Chitosan Beads, Chromatographic Matrix, Composite, Egg White, Extraction, Filtration, Isotherm, Isotherms, Langmuir, Langmuir Isotherm, Lysozyme, Matrix, Membranes, Metal-Ions, Molecularly Imprinted Polymer, Nitrogen, Oxide, Polysaccharide, Pore Volume, Purification, Removal, Route, Separation, Silicon, Size, Sol-Gel Process, Sorption, Sorption Isotherms, Structure, Surface, Surface Area, Systems, Volume, Water

# Title: European Heart Journal

Full Journal Title: [European Heart Journal](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6778&_auth=y&_acct=C000051951&_version=1&_urlVersion=0&_userid=1196840&md5=820bdf1a7910f0e73ca778858b2f5ec6); [European Heart Journal](http://eurheartj.oxfordjournals.org.ludwig.lub.lu.se/archive/)

ISO Abbreviated Title: Eur. Heart J.

JCR Abbreviated Title: Eur Heart J

ISSN: 0195-668X

Issues/Year: 24

Journal Country/Territory: England

Language: English

Publisher: W B Saunders Co Ltd

Publisher Address: 24-28 Oval Rd, London Nw1 7DX, England

Subject Categories:

Cardiac & Cardiovascular Systems: Impact Factor 5.153, / (2000)

? de Jong, J.W. and Schaper, W. (1996), The international rank order of clinical cardiology. *European Heart Journal*, **17** (1), 35-42.

Full Text: [1996\Eur Hea J17, 35.pdf](1996/Eur%20Hea%20J17,%2035.pdf)

Abstract: A cardiological ranking list was prepared based on papers published in 1981-1992. The nations studied comprised the G-7 countries, Belgium, Denmark, Finland, the Netherlands, Norway, Sweden and Switzerland. The number of citations received by these publications was checked. In general the output and citation frequency in the last decade increased, although often temporarily. These data were also related to population size and expenditure on research and development. They show that the United States leads research in clinical cardiology. In most G-7 nations, however, the quality and quantity of cardiological publications lag behind those of the smaller West-European countries. This may be partly due to differences in funding and/or publication in a language other than English.

Keywords: Citation Analysis, Publication Output, Citation

Fox, K., Corr, L., Kaddoura, S. and Peters, N. (2000), European Heart Journal: New impact factor. *European Heart Journal*, **21** (1), 1.

Full Text: [E\Eur Hea J21, 1.pdf](E/Eur%20Hea%20J21,%201.pdf)

Opthof, T. and Fox, K. (2000), Impact Factor of the European Heart Journal. *European Heart Journal*, **21** (15), 1202-1203.

Full Text: [E\Eur Hea J21, 1202.pdf](E/Eur%20Hea%20J21,%201202.pdf)

? Nicholson, A., Kuper, H. and Hemingway, H. (2006), Depression as an aetiologic and prognostic factor in coronary heart disease: a meta-analysis of 6362 events among 146 538 participants in 54 observational studies. *European Heart Journal*, **27** (23), 2763-2774.

Full Text: [2006\Eur Hea J27, 2763.pdf](2006/Eur%20Hea%20J27,%202763.pdf)

Abstract: Aims With negative treatment trials, the role of depression as an aetiological or prognostic factor in coronary heart disease (CHD) remains controversial. We quantified the effect of depression on CHD, assessing the extent of confounding by coronary risk factors and disease severity. Methods and results Meta-analysis of cohort studies measuring depression with follow-up for fatal CHD/incident myocardial infarction (aetiological) or all-cause mortality/fatal CHD (prognostic). We searched MEDLINE and Science Citation Index until December 2003. In 21 aetiological studies, the pooled relative risk of future CHD associated with depression was 1.81 (95% CI 1.53-2.15). Adjusted results were included for 11 studies, with adjustment reducing the crude effect marginally from 2.08 (1.69-2.55) to 1.90 (1.49-2.42). In 34 prognostic studies, the pooled relative risk was 1.80 (1.50-2.15). Results adjusted for left ventricular function result were available in only eight studies; and this attenuated the relative risk from 2.18 to 1.53 (1.11-2.10), a 48% reduction. Both aetiological and prognostic studies without adjusted results had lower unadjusted effect sizes than studies from which adjusted results were included (P < 0.01). Conclusion Depression has yet to be established as an independent risk factor for CHD because of incomplete and biased availability of adjustment for conventional risk factors and severity of coronary disease.

Keywords: 12-Year Follow-up, Acute Myocardial-Infarction, Adjustment, Artery-Bypass-Surgery, Cardiovascular Events, Citation, Cohort, Depression, Enhancing Recovery, Epidemiology, Long-Term Mortality, Medline, Meta-Analysis, Mortality, Psychosocial Factors, Psychotropic-Drugs, Reduction, Risk, Risk Factors, Risk-Factor, Science, Science Citation Index, Sudden Cardiac Death, Treatment

# Title: European Journal of Anaesthesiology

Full Journal Title: [European Journal of Anaesthesiology](http://www3.interscience.wiley.com.ludwig.lub.lu.se/journal/119485129/toc?func=showIssues&code=eja); [European Journal of Anaesthesiology](http://journals.cambridge.org.ludwig.lub.lu.se/action/displayJournal?jid=EJA)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Garcia-Guasch, R., Lucas, M., Mases, A., Cifuentes, I. and Cruz, J. (2001), Bibliometric citation analysis of six anaesthesiology journals comparing 1989 and 1999. *European Journal of Anaesthesiology*, **18** (S21), 4.

Full Text: [2001\Eur J Ana18, 4.pdf](2001/Eur%20J%20Ana18,%204.pdf)

# Title: European Journal of Cancer

Full Journal Title: [European Journal of Cancer](http://www.sciencedirect.com/science?_ob=PublicationURL&_cdi=5024&_pubType=J&_auth=y&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=c64d46e6236f1f55a35b97c71813cdfc)

ISO Abbreviated Title: Eur. J. Cancer

JCR Abbreviated Title: Eur J Cancer

ISSN: 0959-8049

Issues/Year: 16

Journal Country/Territory: England

Language: English

Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Oncology: Impact Factor 3.562, 26/114 (2002)

? Mittra, I. (1993), Axillary lymph node metastasis in breast cancer: Prognostic indicator or lead-time bias? *European Journal of Cancer*, **29** (3), 300-302.

Full Text: [E\Eur J Can29, 300.pdf](E/Eur%20J%20Can29,%20300.pdf)

Keywords: Progesterone Receptors, Estrogen-Receptors, Survival, Recurrence, Relapse, Index

Razavi, D. and Delvaux, N. (1995), The psychiatrist’s perspective on quality of life and quality of care in oncology: Concepts, symptom management, communication issues. *European Journal of Cancer*, **31A** (S6), S25-S29.

Full Text: [E\Eur J Can31A, S25.pdf](E/Eur%20J%20Can31A,%20S25.pdf)

Abstract: The important prevalence of psychosocial problems and psychiatric disturbances that have been reported in oncology, underlines the need for comprehensive psychosocial support for cancer patients and their families. Psychosocial support is designed to preserve, restore or enhance quality of life. Quality of life refers not only to psychosocial distress and adjustment-related problems but also to the management of cancer symptoms and treatment side-effects. Psychosocial interventions designed for this purpose should be divided into five categories: prevention, early detection, restoration, support and palliation. Firstly, preventive interventions are designed to avoid the development of predictable morbidity secondary to treatment and/or disease. Secondly, early detection of patients’ needs or problems refers to the assumption that early interventions’ could have therapeutc results superior to those of delayed support, both for quality of life and survival. Thirdly, restorative interventions refer to actions used when a cure is likely, the aim being the control or elimination of residual cancer disability. Fourthly, supportive rehabilitation is planned to lessen disability related to chronic disease, characterised by cancer illness remission and progression, and to active treatment. Fifthly, palliation is required when curative treatments are likely to no longer be effective, and when maintaining or improving comfort becomes the main goal. Psychological interventions are often multidisciplinary, with a variety of content. The type of psychological intervention ranges from information and education to more sophisticated support programmes including directive (behavioural or cognitive) therapies, or non-directive (dynamic or supportive) therapies. Social interventions usually include financial, household, equipment, and transport assistance depending on individual and family needs and resources, These interventions may be combined with the prescription of pharmacological (psychotropic, analgesic), physical, speech or occupational therapies, especially in rehabilitation programmes. Health care services devoted to delivery of these interventions are hospital, hospice or home-based and organised very differently depending on already available community resources and local practice.

Keywords: Cancer-Patients, Breast-Cancer, Psychological Therapy, Health-Professionals, Adjustment Disorders, Depressive-Disorders, Anticipatory Nausea, Chemotherapy, Alprazolam, Survival

Vlajinac, H.D., Marinković, J.M., Ilić, M.D. and Kocev, N.I. (1997), Diet and prostate cancer: A case-control study. *European Journal of Cancer*, **33** (1), 101-107.

Full Text: [E\Eur J Can33, 101.pdf](E/Eur%20J%20Can33,%20101.pdf)

Abstract: A case-control study, performed in two towns of Serbia (Yugoslavia) from 1990 to 1994, comprised 101 patients with histologically confirmed prostate cancer and 202 hospital controls individually matched by age (±2 years), hospital admittance and place of residence. Dietary information was obtained by using a standard questionnaire. After adjustment for possible confounders, risk factors for prostate cancer appeared to be the highest tertile of protein (odds ratio (OR) = 13.54, 95% confidence interval (CI) = 2.38-77.13), saturated fatty acid (OR = 33.63, 95% CI = 1.03-12.79), fibre (OR = 4.02, 95% CI = 1.38-11.73), and vitamin B12 intake (OR = 2.07, 95% CI = 1.08-3.97), a protective effect was found for the highest tertile of α-tocopherol (OR = 0.15, 95% CI = 0.05-0.53), calcium (OR = 0.37, 95% CI = 0.14-0.99) and iron intake (OR = 0.34, 95% CI = 0.12-0.95). There were significant (P < 0.05) linear trends in the odds ratios for α-tocopherol, vitamin B12, calcium and iron. According to logistic regression step by step analysis, risk factors for prostate cancer were dietary intake of retinol equivalent (OR = 1.64, 95% CI = 1.01-2.67) and vitamin B12 (OR = 1.87, 95% CI = 1.15-3.05), and a protective effect was found for dietary intake of iron (OR = 0.40, 95% CI = 0.27-0.58). (C) 1997 Published by Elsevier Science Ltd.

Keywords: Prostate Cancer, Diet, Case-Control Study, β-Carotene, Food-Consumption, Breast-Cancer, Vitamin-A, Risk, Fat, Carcinoma, Mortality, Hawaii, Colon

Mela, G.S., Cimmino, M.A. and Ugolini, D. (1999), Impact assessment of oncology research in the European Union. *European Journal of Cancer*, **35** (8), 1182-1186.

Full Text: [E\Eur J Can35, 1182.pdf](E/Eur%20J%20Can35,%201182.pdf)

Abstract: In this study the distribution of papers published by authors from the European Union (EU) in oncological journals was analysed, as was the impact of oncological research in the EU compared with that produced in other countries. Papers published during 1995 in the oncological journals listed by ISI (Institute for Scientific Information, Philadelphia, U.S.A.) were downloaded. The parameters of impact factor (IF), source country population and gross domestic product (GDP) were considered. An analysis of the key words, both those reported by the authors and those attributed by ISI, was carried out using a special purpose program. 36.5% of papers published in oncological journals come from the EU (the U.K., Italy, Germany and France ranking at the top) and 40.7% from the U.S.A. The mean IF was 2.4 for EU papers, 3.3 for the US and 2.4 for other countries. Our data confirm that smaller countries performed better than larger ones. The key words analysis shows that the leading fields of research were breast cancer for diseases, cisplatin for drugs and p53 for experimental studies. A standardisation of key words on behalf of journal editors is proposed.

Keywords: Neoplasms, Bibliometrics, Europe

Ugolini, D., Casilli, C. and Mela, G.S. (2002), Assessing oncological productivity: Is one method sufficient? *European Journal of Cancer*, **38** (8), 1121-1125.

Full Text: [E\Eur J Can38, 1121.pdf](E/Eur%20J%20Can38,%201121.pdf)

Abstract: This work analyses the distribution of oncological papers published in 1995 by authors from the European Union (EU) in any journal of all the Subject Categories of the Science Citation Index compiled by ISI (Institute for Scientific Information, Philadelphia, USA) and is based on the country of origin of all of the contributors. The study compares the results with those of a previous study dealing with publications in journals of the ISI Oncology Category based on the country of origin of the corresponding author. The aim of the study was to compare two different methods used to evaluate research productivity in order to understand the extent to which the results are influenced by the methodology adopted. Data on the number of published papers for each country, ratio between the number of occurrences of papers and country population and gross domestic product (GDP), and mean Impact Factors (IF) were compared. While findings on the number of published papers (United Kingdom (UK), Germany and France ranking best), source country population (Sweden, Denmark and the Netherlands ranking best) and gross domestic product (Sweden, Finland and the Netherlands ranking best) showed no important changes, the mean IF value result was, for some countries, very different from the previous study. In particular, while Germany, Belgium, Portugal and France fared well, Norway, Sweden, Austria and Spain showed poorer results. Some hypotheses are advanced, and care in the scientometric interpretation of data is urged. An analysis of the journals in which EU authors published their articles was also carried out and the main SCI categories to which the journals belong are reported. As was expected, many categories other than oncology were represented (biochemistry, haematology, pathology, etc.).

Keywords: Neoplasms, Bibliometrics, Europe

Zheng, T., Holford, T.R., Mayne, S.T., Owens, P.H., Boyle, P., Zhang, B., Zhang, Y.W. and Zahm, S.H. (2002), Use of hair colouring products and breast cancer risk: A case-control study in Connecticut. *European Journal of Cancer*, **38** (12), 1647-1652.

Full Text: [E\Eur J Can38, 1647.pdf](E/Eur%20J%20Can38,%201647.pdf)

Abstract: This case-control study was designed to test the hypothesis that the risk of breast cancer varies by type and colour of the hair colouring products used. A total of 608 cases and 609 controls were included in the study. We found no increased risk associated with the overall use of hair dye products or exclusive use of permanent or temporary types of hair dye products. Among those who reported to have exclusively used semi-permanent types of hair colouring products, some of the ORs were elevated. However, none of the ORs related to age at first use, duration of use, total number of applications, and-years since first use, was statistically significant. There was also no increased risk of breast cancer associated with exclusive use of dark or light hair colouring products, or use of mixed types or colours of hair dye products. We also found no increased risk of breast cancer associated with hair dye use based on an individual’s reason for using a hair colouring product, such as to cover grey-or to change natural hair colour. These data suggest that the use of hair colouring products does not have a major impact on the risk of breast cancer. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Reast Cancer, Case-Control Study, Epidemiology, Hair Dye Products, Dye Use, Coloring Products, Multiple-Myeloma, Exposure, Lymphoma, Women

Grossi, F., Belvedere, O. and Rosso, R. (2003), Geography of clinical cancer research publications from 1995 to 1999. *European Journal of Cancer*, **39** (1), 106-111.

Full Text: [E\Eur J Can39, 106.pdf](E/Eur%20J%20Can39,%20106.pdf)

Abstract: In this paper, we study the geography of publications in clinical cancer research from 1995 to 1999. A Medline search was performed to retrieve papers in clinical oncology reporting phase I, II and III studies published between 1995 and 1999. Only studies reporting antiblastic chemotherapy have been considered, either alone or in combination with other treatments. For each country, the total number of papers, the total Impact Factor (IF), and the mean IF were determined. Similar calculations were performed to compare the European Union versus North America. 3142 papers were identified. The United States ranks first by number of papers (37.7% share), followed by Italy (9.8%), the United Kingdom (8.5%) and Japan (6.9%). Investigators at European institutions published a higher number of papers compared with their North American colleagues (1362 versus 1288). Still the mean IF of North American papers is higher than the papers with a European address (3.54 versus 3.14). The majority of phase I studies were performed in North America, while most of phase III studies were performed in Europe. These results provide information on the geography of clinical cancer research worldwide, which may reflect the human and economic resources involved in this field.

Keywords: Bibliometric Analysis, Clinical Cancer Research, Clinical Trials, Medline, Impact Factor, Countries, Journals

? Garcea, G., Sharma, R.A., Dennison, A., Steward, W.P., Gescher, A. and Berry, D.P. (2003), Molecular biomarkers of colorectal carcinogenesis and their role in surveillance and early intervention. *European Journal of Cancer*, **39** (8), 1041-1052.

Full Text: 2003\Eur J Can39, 1041.pdf

Abstract: Modern medicine is increasingly focused towards population surveillance for disease, coupled with the implementation of preventative measures applied to ‘at-risk’ patients. Surveillance in colorectal cancer is limited by the cost and risk of endoscopy. Trials of putative chemopreventive agents in colorectal cancer are hampered by difficulties in following up large cohorts of patients over long periods of time to ascertain the clinical effect. Research into possible pathways of colorectal carcinogenesis has revealed a range of biological intermediates which could be used in surveillance, the identification of high risk populations and early diagnosis of cancer. The aim of this paper was to review the possible role of biomarkers in surveillance and the timing of intervention. A literature review using both MEDLINE and Web of Science was performed from 1995 onwards using keywords: biomarkers, colorectal cancer, carcinogenesis, chemoprevention, surveillance and screening. Research has identified many potential biomarkers, such as cyclooxgenase-2 (COX-2), oxidative DNA adducts and glutathione S-transferase (GST) polymorphisms, which could be applied in a clinical setting to screen for and detect colorectal cancer. Molecular biomarkers, such as COX-2, oxidative DNA adducts and GST polymorphisms offer new prospects in the detection of early colorectal cancer, surveillance of high-risk populations and prediction of the clinical effectiveness of chemopreventive drugs. Their role could be extended into surgical surveillance for potentially operable disease and post-operative follow-up for disease recurrence. Research should be directed at assessing complementary biomarkers to increase clinical effectiveness in determining management options for patients. (C) 2003 Elsevier Science Ltd. All rights reserved.

Keywords: Beta-Catenin, Biomarkers, Cancer, Carcinogenesis, Chemoprevention, Clinical Effectiveness, Colon-Cancer, Colorectal Cancer, COX-2, Diagnosis, Disease, DNA, DNA-Adducts, Effectiveness, Expression, Familial Adenomatous Polyposis, Follow-Up, Intervention, K-RAS Mutations, Literature, Literature Review, Management, Mass-Spectrometry, Medicine, Mismatch Repair Genes, Polymorphisms, Prostate-Cancer, Recurrence, Research, Review, Risk, S-Transferase M1, Science, Screening, Surgical, Surveillance, Web of Science

Ugolini, D. and Mela, G.S. (2003), Oncological research overview in the European Union. A 5-year survey. *European Journal of Cancer*, **39** (13), 1888-1894.

Full Text: [E\Eur J Can39, 1888.pdf](E/Eur%20J%20Can39,%201888.pdf)

Abstract: This study evaluates the distribution of papers published by European Union (EU) authors in oncological journals from 1996 to 2000, and compares the results with those of a previous study carried out in 1995. The impact of oncological research in the EU is compared with that of the United States (US) and the world, and research trends are highlighted through an analysis of keywords. Data on articles published in oncological journals (ISI Subject Category = ONCOLOGY) selected from Current Contents/Life Science and Current Contents/Clinical Medicine (1996–2000) on the weekly diskette version were downloaded. Mean Impact Factor (IF), source country population and gross domestic product (GDP) were analysed. A special-purpose software to determine the most commonly used keywords was utilised. From 1996 to 2000, 66021 papers were published in the world in oncological journals: 35.5% came from the EU (UK, Italy, Germany, France and The Netherlands ranking the highest) and 38.8% from the US. The total number of EU papers increased from 4063 in 1995 to 4843 in 2000. Compared with the previous study, no important changes were seen, with the top five countries in 1995 maintaining their ranking in 2000. However, some small countries (Denmark, Norway and Ireland) fared worse in 2000, while others (France, Germany and Greece) improved their position. The mean IF for the EU papers was 2.9 compared with 4.0 in the US. The mean IF increased for all of the nations. In particular, while France and Germany showed a very positive performance trend in their respective IFs, countries such as Norway, Denmark and Italy showed less improvement. The analysis of keywords appearing in articles written in 2000 showed that the leading fields of research were breast cancer in the diseases category of keywords, cisplatin and platinum compounds in the drugs category, radiotherapy in the treatment category and apoptosis in the experimental studies category. Variety in the use of keywords should be avoided, and journal editors should encourage their standardisation.

Keywords: Neoplasms, Bibliometrics, Europe

? Garcea, G., Lloyd, T.D., Aylott, C., Maddern, G. and Berry, D.P. (2003), The emergent role of focal liver ablation techniques in the treatment of primary and secondary liver tumours. *European Journal of Cancer*, **39** (15), 2150-2164.

Full Text: 2003\Eur J Can39, 2150.pdf

Abstract: Only 20% of patients with primary or secondary liver tumours are suitable for resection because of extrahepatic disease or the anatomical distribution of their disease. These patients could be treated by ablation of the tumour, thus preserving functioning liver. This study presents a detailed review of established and experimental ablation procedures. The relative merits of each technique will be discussed and clinical data regarding the efficacy of the techniques evaluated. A literature search from 1966 to 2003 was undertaken using MEDLINE, PUBMED and Web of Science databases. Keywords were Hepatocellular carcinoma, liver metastases, percutaneous ethanol injection, cryotherapy, microwave coagulation therapy, radiofrequency ablation, interstitial laser photocoagulation, focused high-intensity ultrasound, hot saline injection, electrolysis and acetic acid injection. Ablative techniques offer a promising therapeutic modality to treat unresectable tumours. Large-scale randomised controlled trials are required before widespread acceptance of these techniques can occur. (C) 2003 Elsevier Ltd. All rights reserved.

Keywords: Acetic-Acid Injection, Carcinoma, Colorectal-Cancer, Databases, Disease, Efficacy, Ethanol, Hepatocellular Carcinomas, Intensity Focused Ultrasound, Interstitial Laser Photocoagulation, Literature, Liver Ablation, Liver Metastases, Long-Term, Malignant Hepatic Neoplasms, Microwave Coagulation Therapy, Percutaneous Ethanol Injection, Primary, Radiofrequency Tissue Ablation, Review, Science, Small Hepatocellular-Carcinoma, Therapy, Treatment, Tumours, Ultrasound, Web of Science

? Kogevinas, M., Fernandez, F., Garcia-Closas, M., Tardon, A., Garcia-Closas, R., Serra, C., Carrato, A., Castano-Vinyals, G., Yeager, M., Chanock, S.J., Lloreta, J., Rothman, N., Real, F.X., Dosemeci, M., Malats, N. and Silverman, D. (2006), Hair dye use is not associated with risk for bladder cancer: Evidence from a case-control study in Spain. *European Journal of Cancer*, **42** (10), 1448-1454.

Full Text: [2006\Eur J Can42, 1448.pdf](2006/Eur%20J%20Can42,%201448.pdf)

Abstract: An increased bladder cancer risk has been suggested among users of hair dyes. We evaluated this association among females in a hospital-based case-control study in Spain (152 female incident cases, 166 female controls). The effect of hair dye use was also evaluated among potentially susceptible subgroups defined by NAT1, NAT2, CYP1A2, GSTM1, GSTT1 and GSTP1 genotypes. Use of any hair dye (OR = 0.8, CI 0.5–1.4) or of permanent hair dyes (OR = 0.8, CI 0.5–1.5) was not associated with increased risk. Small non-significant increases in risks were observed in a lagged analysis that ignores exposures within ten years of diagnosis (OR = 1.3, CI 0.8–2.2). No trend in risk with increasing exposure was seen for duration of use, average use or cumulative use. None of the polymorphisms examined significantly modified the hair dye associated risk. Overall, this study does not support an association between hair dye use and bladder cancer.

Keywords: Bladder Cancer, Hair Dyes, Aromatic Amines, SNPs, Case-Control Study

? Cambrosio, A., Keating, P., Mercier, S., Lewison, G. and Mogoutov, A. (2006), Mapping the emergence and development of translational cancer research. *European Journal of Cancer*, **42** (18), 3140-3148.

Full Text: [2006\Eur J Can42, 3140.pdf](2006/Eur%20J%20Can42,%203140.pdf)

Abstract: Cancer research is one of the principal targets of translational research, yet the nature of the relationships between different forms of cancer research remains controversial. The paper examines publications in the cancer field during the 1980–2000 period. A network analysis software program was used to map evolving patterns of inter-citations between cancer publications, their different research levels and the transformation of their relational content. Both inter-citation and content maps provide striking evidence of the consolidation in the 1990s of a translational interface that was practically non existent a few decades before. In 1980, research was polarized according to the allegiance to either a clinical or a laboratory style. This same duality obtains in the year 2000, albeit with the additional presence of a third, biomedical player whose activities are similarly structured by a common orientation, rather than by an exclusive commitment to a specific sub-domain.

Keywords: Analysis, Bibliometric Analysis, Biology, Biomedicine, Cancer, Clinical, Clinical Cancer Research, Commitment, DEC, Development, Emergence, Intercitation Networks, Interface, Levels, Neoplasms, Orientation, Paper, Program, Publications, Research, Software, Targets, Transformation, Translational Research

? López-Illescas, C., de Moya-Anegón, F. and Moed, H.F. (2008), The actual citation impact of European oncological research. *European Journal of Cancer*, **44** (2), 228-236.

Full Text: [2008\Eur J Can44, 228.pdf](2008/Eur%20J%20Can44,%20228.pdf)

Abstract: This study provides an over-view of the research performance of major European countries in the field Oncology, the most important journals in which they published their research articles, and the most important academic institutions publishing them. The analysis was based on Thomson Scientific’s Web of Science (WoS) and calculated bibliometric indicators of publication activity and actual citation impact. Studying the time period 2000-2006, it gives an update of earlier studies, but at the same time it expands their methodologies, using a broader definition of the field, calculating indicators of actual citation impact, and analysing new and policy relevant aspects. Findings suggest that the emergence of Asian countries in the field Oncology has displaced European articles more strongly than articles from the USA; that oncologists who have published their articles in important, more general journals or in journals covering other specialties, rather than in their own specialist journals, have generated a relatively high actual citation impact; and that universities from Germany, and - to a lesser extent - those from Italy, the Netherlands, UK, and Sweden, dominate a ranking of European universities based on number of articles in oncology. The outcomes illustrate that different bibliometric methodologies may lead to different outcomes, and that outcomes should be interpreted with care. (c) 2007 Elsevier Ltd. All rights reserved.

Keywords: Bibliometrics, Europe, Neoplasms, Medical Oncology, Research Support, Biomedical Research, Bibliographic Databases, Information Science, Periodicals, Statistics & Numerical Data, Cancer-Research, Publication, Indicators, Countries, Journals, Quality, Union

? Heikkila, K., Ebrahim, S. and Lawlor, D.A. (2008), Systematic review of the association between circulating interleukin-6 (IL-6) and cancer. *European Journal of Cancer*, **44** (7), 937-945.

Full Text: 2008\Eur J Can44, 937.pdf

Abstract: Our aim was to systematically review the epidemiologic evidence for an association of circulating interleukin-6 (IL-6), an inflammatory cytokine and cancer. We systematically searched electronic databases EMBASE, MEDLINE and Web of Science for the studies of circulating IL-6 and any form of cancer. We identified and reviewed 189 discrete studies, consisting of 177 prevalent studies and three prospective studies. Cancer patients’ IL-6 concentrations were higher than healthy controls’ in most studies, but the results of investigations comparing IL-6 in cancer patients and individuals with benign diseases were less consistent. Due to the small number of prospective studies it is impossible to determine whether IL-6 is causally related to cancer. Large prospective studies of circulating IL-6 or studies using the functional variants of the IL-6 gene as instruments for circulating IL-6 concentrations would provide information on possible aetiological links between IL-6 and malignancy. (c) 2008 Elsevier Ltd. All rights reserved.

Keywords: Body-Mass Index, Breast-Cancer, C-Reactive Protein, Cancer, Colorectal-Cancer, D-Dimer Levels, Databases, Epidemiology, Functional, IL-6, Information, Interleukin-6, Malignancy, Multiple-Myeloma, Pancreatic-Cancer, Prospective Studies, Prostate-Cancer, Review, Science, Serum-Levels, Squamous-Cell Carcinoma, Systematic, Systematic Review, Web Of Science

? Lewison, G., Purushotham, A., Mason, M., Mcvie, G. and Sullivan, R. (2010), Understanding the impact of public policy on cancer research: A bibliometric approach. *European Journal of Cancer*, **46** (5), 912-919.

Full Text: [2010\Eur J Can46, 912.pdf](2010/Eur%20J%20Can46,%20912.pdf)

Abstract: With global spend on cancer research from the public sector now in excess of 14 billion euro, as well as the increasing burden of disease in market economies and low-middle income countries through changing demographics (ageing and population growth) cancer is now one of the most complex and global public policy issues. Using novel bibliometrics we have sought to investigate changes in research activity (total output), relative commitment and collaborations between countries/regions with similar healthcare and population and development parameters - United Kingdom, France, Germany, Canada and Sweden to assess the utility of this policy research approach by analysing two different cohorts (1995-1999 and 2000-2004) to study the impact of changes on research publications as a surrogate for overall research activity. (C) 2009 Elsevier Ltd. All rights reserved.

Keywords: Bibliometric, Bibliometrics, Cancer, Complex, Elsevier, Evidence, France, Funding, Geography, Germany, Global, Growth, Impact, Publications, Regional, Research, Research Activity, Sweden, United Kingdom

? Sullivan, R., Lewison, G. and Purushotham, A.D. (2011), An analysis of research activity in major UK cancer centres. *European Journal of Cancer*, **47** (4), 536-544.

Full Text: [2011\Eur J Can47, 536.pdf](2011/Eur%20J%20Can47,%20536.pdf)

Abstract: The organisation of cancer research is critical to its overall creativity and productivity. Cancer centres are a major organisational structure for this research, however, little is known about their effect on research or how national policy-making intersects with this complex policy nexus. This study of the evolution of United Kingdom cancer centres (UKCC), part of a wider European and United States programme, uses a bibliometric analysis of research activity prior to the creation of the NCRI and after its formation (1995-2004/5). In terms of critical research mass UKCC are very heterogeneous with a fourfold difference between the top and bottom quintiles. UK centres published just over one eighth of the total UKCC in 1995 but almost a quarter by 2004. This centrification occurred in the absence of any national strategy. Overall these centres conduct more fundamental (laboratory-based) research than that being conducted in the wider network but this hides major heterogeneity. UKCC collaborate with European investigators in 5-28% of all their outputs and with USA the range is between 6% and 21%. We have also derived new measures of research impact on clinical management and the general public as well as the impact of national policy on research assessment for certain types of cancer research. (c) 2010 Elsevier Ltd. All rights reserved.

Keywords: Analysis, Assessment, Bibliometric, Bibliometric Analysis, Bibliometrics, Cancer, Cancer Centres, Clinical, Clinical Management, Collaboration, Creativity, Culture, Evolution, Funding, General, Heterogeneity, Impact, Management, Mar, National Strategy, Network, Oncopolicy, Organization, Policy, Policy Making, Productivity, Public, Public Policy, Research, Research Assessment, Rights, Science, Strategy, Structure, Trends, UK, United Kingdom, United States, USA

# Title: European Journal of Cancer Care

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? Foster, C., Wright, D., Hill, H., Hopkinson, J. and Roffe, L. (2009), Psychosocial implications of living 5 years or more following a cancer diagnosis: A systematic review of the research evidence. *European Journal of Cancer Care*, **18** (3), 223-247.

Full Text: 2009\Eur J Can Car18, 223.pdf

Abstract: Mortality associated with cancer remains high, but more people are surviving cancer. Some people experience long-term problems associated with cancer and its treatment, and there is a need to know how to support them. This systematic literature review explores primary research for psychosocial implications of long-term survival (>= 5 years) following a cancer diagnosis and interventions designed to address psychosocial problems in the long term. A systematic search of BIDS, BNI, Cancer.gov, CINAHL, MEDLINE, PsychINFO and Web of Science was conducted to identify research publications from 1960 to 2006. Papers were selected on the basis of pre-defined criteria and rated by three independent coders. Forty-three studies met the eligibility criteria. These indicated that most people experience few problems five or more years after their diagnosis of cancer. However, 20-30% of survivors consistently reported problems associated with cancer and its treatment including physical problems, poorer quality of life, psychological distress, sexual problems, problems with social relationships and financial concerns. Not all cancer types are represented in this review. Only two intervention studies met the eligibility criteria. Research is needed to establish appropriate interventions to support those experiencing problems in the long term to enhance well-being.

Keywords: Adjustment, Adjuvant Chemotherapy, Adult, African-American, Age, Bone-Marrow Transplantation, Breast-Cancer, Cancer, Childhood-Cancer, Diagnosis, Distress, Intervention, Intervention Studies, Interventions, Issues, Literature, Literature Review, Long-Term Survivors, Mortality, Oncology, Primary, Psychosocial, Publications, Quality of Life, Quality-of-Life, Research, Review, Science, Social, Survival, Systematic, Systematic Literature Review, Systematic Review, Treatment, Web of Science

? O’Connor, S.J. (2010), What do duplicate publications; self-plagiarism and the monotony of endless descriptive studies signify: Publication pressures or simply a collective lack of imagination? *European Journal of Cancer Care*, **19** (3), 281-283.

Full Text: [2010\Eur J Can Car19, 281.pdf](2010/Eur%20J%20Can%20Car19,%20281.pdf)

Keywords: Cancer Research, Descriptive Studies, Duplicate Publication, Originality, Plagiarism, Publication, Publications, Self-Plagiarism

? Jack, B., Boland, A., Dickson, R., Stevenson, J. and Mcleod, C. (2010), Best supportive care in lung cancer trials is inadequately described: A systematic review. *European Journal of Cancer Care*, **19** (3), 293-301.

Full Text: [2010\Eur J Can Car19, 293.pdf](2010/Eur%20J%20Can%20Car19,%20293.pdf)

Abstract: The objective of the paper was to identify and discuss clinical terms associated with the availability and delivery of best supportive care for patients with lung cancer in randomised controlled clinical trials. Systematic review was carried out of relevant studies without language restrictions identified through Medline, EMBASE, Science Citation Index (Web of Science and ISI Proceedings) and Cochrane Library. Reference lists of retrieved articles were also searched to identify further studies. Articles describing randomised controlled trials or systematic reviews with a comparator arm of best supportive care for patients with lung cancer were studied. Definitions of best supportive care and elements of best supportive care were reported. Included clinical studies (n = 40) did not adequately describe or outline either the components or the delivery of best supportive care for patients in lung cancer trials. None of the identified studies provided a clear definition of a patient pathway in relation to best supportive care, or a clear list of components. Clinical studies are being conducted without a clear definition of the best supportive care provided in the comparator arms of trials. Inadequate definitions mean that all direct and indirect comparisons in trials comparing active treatments with best supportive care must be interpreted with caution.

Keywords: Articles, Best Supportive Care, BSC, Cancer, Citation, Elderly-Patients Pts, III Randomized-Trial, ISI, Lung Cancer Trials, Medline, Multicenter, NSCLC, Phase-III, Platinum-Based Chemotherapy, Plus Chemotherapy, Quality-of-Life, Review, Science, Science Citation Index, Survival, Systematic Review, Web of Science

# Title: European Journal of Cancer Prevention

Full Journal Title: European Journal of Cancer Prevention

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? Lagerros, Y.T., Hsieh, S.F. and Hsieh, C.C. (2004), Physical activity in adolescence and young adulthood and breast cancer risk: A quantitative review. *European Journal of Cancer Prevention*, **13** (1), 5-12.

Abstract: Physical activity habits are potentially modifiable and could therefore be targeted in a primary prevention strategy against breast cancer, provided there is causality and a sufficiently strong relationship. Our objective of this quantitative review was to provide a summary estimate of the association of moderate/vigorous recreational physical activity during adolescence/young adulthood with breast cancer risk, and to determine whether a dose-response relationship exists. Data sources included studies in humans relating physical activity to breast cancer risk, published between January 1966 and October 2002, identified on MEDLINE, the Web of Science, from reference lists and related reviews. The main characteristics of each study, the point estimates of relative risk (RR) and confidence intervals (CI) were extracted from 19 case-control and four cohort studies. Comparing the highest to the lowest category of physical activity, the summary RR from the random effects model was 0.81 (95% CI 0.73-0.89). This almost 20% risk reduction proved to be fairly consistent, despite variation in populations and methods. Each one-hour increase of recreational physical activity/week during adolescence was associated with a 3% (95% CI 0-6%) risk reduction. Physical activity in 12-24-year-old females significantly reduces risk of breast cancer. Heterogeneity may be explained by different methods to measure activity. (C) 2004 Lippincott Williams Wilkins.

Keywords: Activities, Age, Body-Mass, Breast Cancer, Breast Neoplasm, Cancer, Causality, Cohort, Cohort Studies, Confidence Intervals, Coronary-Heart-Disease, Dose-Response, Early-Life, Epidemiologic Studies, Exercise, Exercise, Humans, Leisure, Leisure-Time, Meta-Analysis, Model, Physical Activity, Prevention, Primary, Primary Prevention, Quantitative, Relative Risk, Reproductive-System, Review, Risk, Risk Reduction, Science, Strategy, United-States, Web of Science, Women

? Mazaki, T.M., Masuda, H. and Takayama, T. (2011), Polymorphisms and pancreatic cancer risk: A meta-analysis. *European Journal of Cancer Prevention*, **20** (3), 169-183.

Abstract: Increasing evidence suggests that variants of common and low-penetrance genes are involved in pancreatic cancer (PC) carcinogenesis. We undertook a meta-analysis of published studies to assess evidence regarding the risk associated with these genes. MEDLINE, Web of Science, ProQuest, Google Scholar, and international conference proceedings were searched and citations in relevant primary and review articles were collected. The studies that we considered eligible included all reports that investigated an association between genetic polymorphisms and PC. We identified 23 studies that evaluated the risk effects on PC of common alleles for 13 gene polymorphisms. A significant association was recognized between ALDH 2\*1\*2 polymorphisms and PC [odds ratio (OR) = 1.37, 95% confidence interval (CI) = 1.07-1.75, P = 0.01] based on only two studies. Although the overall results for MTHFR T677T are negative, sensitivity analysis stratified by ethnic background showed a significant association between Caucasian and MTHFR T677T polymorphisms and PC (OR = 1.66, 95% CI = 1.10-2.52, P = 0.02). The risk for PC was higher in individuals with MTHFR C677T or TT polymorphisms and a smoking habit (OR = 2.52, 95% CI = 1.05-6.09, P = 0.04). These findings lead us to support the hypothesis that MTHFR T677T and ALDH 2\*1\*2 polymorphisms may play a carcinogenetic role in PC and represent the candidates for low-penetrance susceptibility alleles identified to date. Although their genetic risks are modest, the high frequency in the population shows that they may have a considerable impact on the incidence of PC. Definite conclusions will be contingent on studies with a larger sample size that determine the risk estimates associated with other variants, gene-gene, and gene-environment interactions. European Journal of Cancer Prevention 20:169-183 (C) 2011 Wolters Kluwer Health vertical bar Lippincott Williams & Wilkins.

Keywords: Adenocarcinoma, Alcohol, Analysis, Association, Cancer, Carcinogenesis, Citations, DNA-Repair Genes, Frequency, Genetic, Google Scholar, Health, Impact, Journal, Lead, Meta-Analysis, Methylenetetrahydrofolate Reductase, Mthfr, N34S, Pancreatic Cancer, Polymorphisms, Population, Primary, Progression, Ratio, Review, Risk, Science, Smoking, Spink1, Susceptibility, Web of Science

? Magalhaes, B., Peleteiro, B. and Lunet, N. (2012), Dietary patterns and colorectal cancer: Systematic review and meta-analysis. *European Journal of Cancer Prevention*, **21** (1), 15-23.

Full Text: 2012\Eur J Can Pre21, 15.pdf

Abstract: Studies on the association between single foods or nutrients and colorectal cancer have provided inconsistent results. Previous reviews did not conduct a quantitative synthesis of the relation with dietary patterns. We conducted a systematic review and meta-analysis of studies addressing the association between dietary patterns and colorectal cancer. Studies quantifying the association between dietary patterns (defined a posteriori) and colorectal cancer were identified in PubMed (until 01.08.2010) and through backward and forward citation tracking (ISI Web of Science and Scopus). Summary relative risk (RR) estimates and 95% confidence intervals (95% CI) were computed for highest versus lowest levels of exposure, for colon cancer (CC) and rectal cancer (RC), and for proximal and distal CC, by random effects meta-analysis. Heterogeneity was quantified using the I(2) statistic. Eight cohort and eight case-control studies defining patterns through principal components and factor analyses were included in the systematic review. Meta-analyses were conducted for three patterns: (i) ‘drinker,’ characterized by high alcohol consumption (CC: RR(combined) = 0.96, 95% CI: 0.82-1.12, I(2) = 0.6%; RC: RR(combined) = 0.83, 95% CI: 0.47-1.45, I(2) = 65.1%); (ii) ‘healthy,’ characterized by high fruit/vegetables consumption (CC: RR(combined) = 0.80, 95% CI: 0.70-0.90, I(2) = 55.1%; RC: RR(combined) = 1.02, 95% CI: 0.89-1.17, I(2) = 10.8%); (iii) ‘western,’ characterized by high red/processed meat consumption (CC: RR(combined) = 1.29, 95% CI: 1.13-1.48, I(2) = 31.7%; RC: RR(combined) = 1.13, 95% CI: 0.92-1.39, I(2) = 40.6%). Summary estimates for proximal and distal CC were similar. The risk of CC was increased with patterns characterized by high intake of red and processed meat and decreased with those labelled as ‘healthy.’ No significant associations were observed for RC. European Journal of Cancer Prevention 21:15-23 (C) 2011 Wolters Kluwer Health vertical bar Lippincott Williams & Wilkins.

Keywords: Adenoma, African-Americans, Alcohol, Alcohol Consumption, Association, Associations, Cancer, Case-Control, Case-Control Studies, Citation, Cohort, Colon Cancer, Colon-Cancer, Colorectal Cancer, Confidence Intervals, Dietary Patterns, Eating Patterns, Epidemiologic Evidence, Exposure, Foods, Health, ISI, ISI Web of Science, Journal, Meat, Meta Analysis, Meta-Analysis, Migrants, Nutrients, Pubmed, Quantitative, Rectal Cancer, Rectal-Cancer, Relative Risk, Review, Risk, Science, Scopus, Synthesis, Systematic, Systematic Review, Web of Science, Women

? An, W., Bai, Y., Deng, S.X., Gao, J., Ben, Q.W., Cai, Q.C., Zhang, H.G. and Li, Z.S. (2012), Adiponectin levels in patients with colorectal cancer and adenoma: A meta-analysis. *European Journal of Cancer Prevention*, **21** (2), 126-133.

Full Text: 2012\Eur J Can Pre21, 126.pdf

Abstract: Inconsistent results with regard to adiponectin levels in patients with colorectal cancer (CRC) and adenoma have been reported. To evaluate adiponectin levels in patients with CRC and adenoma, a meta-analysis on studies which compared adiponectin levels in patients with CRC or adenoma with healthy controls was carried out. A literature search was performed through Pubmed, EMBASE, and Science Citation Index Expanded database. Pooled-weighted mean differences and 95% confidence intervals (95%CI) were calculated by using random-effects models. Heterogeneity between studies was assessed using the Cochran’s Q and I(2) statistics. A total of 13 studies were identified, which included 2632 cases of CRC or adenoma and 2753 healthy controls. Adiponectin levels were significantly lower in patients with CRC or adenoma compared with healthy controls, with significant heterogeneity [weighted mean differences of -1.51 (95% CI: -2.42 to -0.59; P(heterogeneity) < 0.001) for CRC and -1.29 (95% CI: -2.01to -0.58; P(heterogeneity) < 0.001) for colorectal adenoma, respectively]. On stratified analysis of CRC, significant difference in adiponectin levels between patients with CRC and healthy controls was reported only in case-control studies or small sample size studies (n<100), but not in nested case-control studies or large sample size studies (n >= 100). In addition, metaregression analysis indicated that study design and sample size partly contributed to the significant heterogeneity (P=0.022 for study design and P=0.018 for sample size, respectively). For colorectal adenoma studies, stratified analysis indicated that sample size was one of the heterogeneous factors. Sensitivity analysis showed that there were no changes in the direction of effect when any one study was excluded. No publication bias was detected. Adiponectin levels are lower in patients with CRC or colorectal adenoma compared with those in healthy controls. Future studies are warranted to clarify the association of adiponectin levels and carcinogenesis of the colorectum. European Journal of Cancer Prevention 21:126-133 (C) 2012 Wolters Kluwer Health | Lippincott Williams & Wilkins.

Keywords: Adenoma, Adiponectin, Analysis, Association, Author, Bias, Cancer, Carcinogenesis, Case-Control, Case-Control Studies, China, Citation, Colon-Cancer, Colorectal Adenoma, Colorectal Cancer, Confidence Intervals, Design, Differences, Embase, Health, Insulin-Resistance, Journal, Leptin, Literature, Meta Analysis, Meta-Analysis, Metabolic Syndrome, Nested Case-Control, Obesity, Patients, Plasma Adiponectin, Publication, Publication Bias, Risk, Science, Science Citation Index, Science Citation Index Expanded, Shanghai, Statistics, Visceral Fat Accumulation

# Title: European Journal of Cardio-Thoracic Surgery

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? van der Heijden, G.J.M.G., Nathoe, H.M., Jansen, E.W.L. and Grobbee, D.E. (2004), Meta-analysis on the effect of off-pump coronary bypass surgery. *European Journal of Cardio-Thoracic Surgery*, **26** (1), 81-84.

Full Text: [2004\Eur J Car-Tho Sur26, 81.pdf](2004/Eur%20J%20Car-Tho%20Sur26,%2081.pdf)

Abstract: Objective: To assess the effect of conventional coronary artery bypass surgery (CABG) compared to the off-pump procedure (OPCAB). Methods: Based on randomised trials found in PubMed and Science Citation Index, an overall odds ratio and 95% confidence interval was calculated for the combined endpoint of mortality, stroke and myocardial infarction. Results: The 18 randomised trials included 1584 patients (783 OPCAB, 801 CABG). The odds ratio was 0.73 (95% CI = 0.26; 2.04) at 2-week post-surgery, 0.75 (0.39; 1.42) at 1-month post-surgery. 0.55 (0.28; 1.08) at 3-month post-surgery, and 0.66 (0.38; 1.15) at 1-year post-surgery. Conclusions: The outcome of this meta-analysis shows favourable results for OPCAB for the combined endpoint of mortality, stroke and myocardial infarction at short and long term follow-up. However, none of the risk reductions reach statistical significance at the conventional level. Based on our results OPCAB appears to be equivalent to CABG. (C) 2004 Elsevier B.V. All rights reserved.

Keywords: Beating-Heart, Cardiopulmonary Bypass, Citation, Complete Revascularization, Elsevier, Graft-Surgery, Heterogeneity, Inflammatory Response, Low-Risk Patients, Meta-Analysis, Mortality, Myocardial Injury, Off-Pump Coronary Bypass Surgery, On-Pump, Randomised Trials, Randomized Trials, Risk, Science, Science Citation Index, Stroke, Surgery

? Tan, C., Sedrakyan, A., Browne, J., Swift, S. and Treasure, T. (2006), The evidence on the effectiveness of management for malignant pleural effusion: A systematic review. *European Journal of Cardio-Thoracic Surgery*, **29** (5), 829-838.

Full Text: 2006\Eur J Car-Tho Sur29, 829.pdf

Abstract: The aim of this study was to review systematically the available evidence on pleurodesis for malignant effusion, focusing on the choice of the agents, route of delivery and other strategies to improve outcomes. Four electronic databases (MEDLINE, EMBASE, Web of Science and Cochrane Controlled Trials Register) were searched, reference lists checked and letters requesting details of unpublished trials and data sent to authors of previous trials. Studies of malignant pleural effusion in humans were selected with no language restrictions applied. Criteria for randomised clinical trial (RCT) eligibility were random allocation of patients and non-concurrent use of another experimental medication or device. Methodological quality evaluation of the trials was based on randomisation, blinding, allocation concealment and intention to treat analysis. A random effect model was used to combine the relative risk estimates of the treatment effects whenever pooling for an overall effect was considered appropriate. Forty-six RCTs with a total of 2053 patients with malignant pleural effusions were reviewed for effectiveness of pleurodesis. Talc tended to be associated with fewer recurrences when compared to bleomycin (RR, 0.64; 95% CI, 0.34-1.20) and, with more uncertainty, to tetracycline (RR, 0.50; 95% CI, 0.06-4.42). Tetracycline (or doxycycline) was not superior to bleomycin (RR, 0.92; 95% CI, 0.61-1.38). When compared with bedside talc slurry, thoracoscopic talc insufflation was associated with a reduction in recurrence (RR, 0.21; 95% CI, 0.05-0.93). Strategies such as rolling the patient after instillation of the sclerosing agent, protracted drainage of the effusion and use of larger chest tubes were not found to have any substantial advantages. Talc appears to be effective and should be the agent of choice for pleurodesis. Thoracoscopic talc insufflation is associated with fewer recurrences of effusions compared with bedside talc slurry, but this is based on two small studies. Where thoracoscopy is unavailable bedside talc pleurodesis has a high success rate and is the next best option. Crown Copyright (c) 2005 Published by Elsevier B.V. All rights reserved.

Keywords: Analysis, Authors, Breast-Cancer, Chemical Pleurodesis, Clinical Trial, Cochrane, Copyright, Corynebacterium-Parvum, Databases, Effectiveness, Embase, Evaluation, Humans, Intracavitary Bleomycin, Intrapleural Tetracycline, Malignant Effusion, Malignant Pleural Effusion, Management, Medication, Medline, Model, Outcomes, Pleurodesis, Pleuroperitoneal Shunts, Prospective Randomized-Trial, Recurrence, Relative Risk, Review, Risk, Science, Small-Bore, Success, Systematic, Systematic Review, Talc Slurry, Tetracycline Pleurodesis, Treatment, Vats, Web of Science

? Zhong, W.Z., Yang, X.N., Bai, J.L., Yang, J.J., Manegold, C. and Wu, Y.L. (2008), Complete mediastinal lymphadenectomy: the core component of the multidisciplinary therapy in resectable non-small cell lung cancer. *European Journal of Cardio-Thoracic Surgery*, **34** (1), 187-195.

Full Text: 2008\Eur J Car-Tho Sur34, 187.pdf

Abstract: There is a great deal of concern about metastasis of lung cancer to regional lymph nodes, due partly to the work of groups of thoracic surgeons in Japan and North America beginning in the 1970s. The classification of regional lymph node stations for lung cancer staging published by Mountain and Drester has been widely adopted for more than ten years. Anatomic landmarks for 14 levels of intrapulmonary, hilar, and mediastinal lymph nodes stations are designated. Skip transfer and occult lymph node metastasis, confirmed by studies regarding the mode of spread of intrathoracic lymphatic metastasis, are two theoretical bases for complete mediastinal lymphadenectomy of lung cancer. However, whether or not the degree of the dissection influences prognosis, the role of systematic nodal dissection (SND) vs mediastinal lymph node sampling (MLD) in resectable non-small cell lung cancer (NSCLC) remains controversial. A systematic literature search was performed to identify relevant reports, making full use of the ‘Cited by, ‘ ‘Related Records, ‘ ‘References,’ and ‘Author Index’ functions in the PUBMED and ISI Web of Science databases. This paper presents a review of the rote of mediastinal lymph node distribution and methods of determining suitability for hilar and mediastinal lymphadenectomy based on the four subsets of stage IIIA-N2, balancing the cost vs effect of mediastinal lymph node dissection in resectable NSCLC, focusing on the stage migration bias in clinical trials comparing SND and MLS, recommending a reasonable node dissection sequence, improving the prospects for the perioperative anti-tumor therapy based on mediastinal. lymphadenectomy, and evaluating the various preoperative staging techniques. Finally, we believe that, besides the role of complete resection and accurate staging, the complete mediastinal lymphadenectomy is the core component of the lung cancer multidisciplinary therapy, and suggest that the values of lymphadenectomy should be further assessed using decision-tree analysis based on large-scale prospective randomized trials and pooled analysis to evaluate the costs vs effects. (C) 2008 European Association for Cardio-Thoracic Surgery. Published by Elsevier B.V. All rights reserved.

Keywords: Acosog Z0030 Trial, Analysis, Bias, Cancer, Carcinoma, Clinical Trials, Combined Modality Therapy, Costs, Databases, Ests Guidelines, Induction Chemotherapy, ISI, Japan, Literature, Lung Cancer, Lymph Node Excision, Lymph-Node Dissection, Major Pulmonary Resections, Mediastinal Lymph Node, Metastases, Neoplasm Staging, Non-Small Cell Lung, Nsclc, Pooled Analysis, Prognosis, Pubmed, Randomized Controlled-Trials, References, Review, Science, Stage, Surgery, Survival, Systematic, Therapy, Web of Science

# Title: European Journal of Cardiovascular Nursing

Full Journal Title: [European Journal of Cardiovascular Nursing](http://www.sciencedirect.com/science/journal/14745151)

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Subject Categories:

: Impact Factor

? Fridlund, B., Hildebrandt, L., Hildingh, C. and Lidell, E. (2007), Status and trends in Swedish dissertations in the area of cardiovascular nursing. *European Journal of Cardiovascular Nursing*, **6** (1), 72-76.

Full Text: [2007\Eur J Car Nur6, 72.pdf](2007/Eur%20J%20Car%20Nur6,%2072.pdf)

Abstract: In Europe, cardiovascular nursing (CVN) is a young branch of nursing science. The explicit knowledge contained in CVN dissertations has, so far, not been studied in Europe, and this is especially true in the case of Sweden. Accordingly, the aim of this literature study was to describe the status of and compare trends in Swedish dissertations in the area of CVN in terms of organisational structure, approach, research strategy, social orientation and socio-demographic aspects. The literature search resulted in 29 dissertations and a 26-item questionnaire that illuminated the problem areas. Most dissertations were produced in the universities of Goteborg, Halmstad and Linkoping; a minority had a nurse as main supervisor; rehabilitation was the most common CVN approach; very few of the dissertations had an experimental design; and the majority was hospital-based. The main trends were (A) an increase in dissertations that were written during the last 6 years, (B) an increased number of nurses as main supervisors as well as publication in nursing journals, (C) an increase in hospital care settings while a decrease in community settings, and finally, (D) an increased number of dissertations addressing the issues of tertiary prevention as well as focusing on patients and next-of-kin as target groups. An important implication is to stimulate nurse-led interventions at all preventative levels in order to maintain or improve the cardiac health of both healthy and sick individuals, but also in order to visualize CVN and distinguish it from cardiology.

Keywords: Approach, Cardiovascular, Care, Community, Design, Europe, Experimental, Experimental Design, Health, Hospital, Hospital Care, Interventions, Journals, Knowledge, Literature, Nurses, Nursing, Patients, Prevention, Publication, Questionnaire, Rehabilitation, Research, Science, Social, Structure, Sweden, Trends, Universities

# Title: European Journal of Cardiovascular Prevention & Rehabilitation

Full Journal Title: European Journal of Cardiovascular Prevention & Rehabilitation

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: Impact Factor

? Petter, M., Blanchard, C., Kemp, K.A.R., Mazoff, A.S. and Ferrier, S.N. (2009), Correlates of exercise among coronary heart disease patients: Review, implications and future directions. *European Journal of Cardiovascular Prevention & Rehabilitation*, **16** (5), 515-526.

Abstract: Despite the well-documented benefits of exercise, adherence among patients with coronary heart disease (CHD) has been low during and after cardiac rehabilitation (CR) as well as among patients not attending CR. Therefore, an understanding of the factors that influence exercise in this population is crucial to assist in the development of effective interventions. The goal of this review was to document the correlates of exercise of CHD patients in all CR contexts from a social-ecological perspective that addresses multiple levels of influence on exercise. The search strategy included PUBMED, PsychINFO and Web of Science databases. In all, 121 studies, examining 32 different correlates of exercise, with a total of 25 217 participants were included. Across all CR contexts, six variables were consistently related to exercise (self-regulatory self-efficacy, health status, intention, perceived control, beliefs/benefits and previous physical activity). Several variables were also related to exercise in three of four contexts (e.g. task self-efficacy, perceived barriers, attitude, action planning, sex and employment status). Many of the variables consistently related to exercise may be amenable to change through the development and implementation of appropriate interventions. Specific suggestions are made for each relevant variable to assist CR staff and other healthcare practitioners in 32 promoting exercise among CHD patients. Current gaps in literature such as a lack of prospective studies and research examining broader (e.g. policy level) correlates are also discussed. Eur J Cardiovasc Prev Rehabil 16:515-526 (C) 2009 The European Society of Cardiology.

Keywords: Adherence, Artery-Bypass-Surgery, Attitude, Barriers, Cardiac Rehabilitation, Cardiac Rehabilitation, Cardiology, Control, Controlled-Trial, Coronary Heart Disease, Correlates, Databases, Development, Disease, Effective Interventions, Employment, Exercise, Health Status, Home-Based Exercise, Interventions, Literature, Myocardial-Infarction Patients, Physical Activity, Physical-Activity Maintenance, Planned Behavior, Policy, Prospective Studies, Pubmed, Quality-of-Life, Rehabilitation, Research, Review, Risk-Factor Modification, Science, Self-Efficacy, Self-Efficacy Expectation, Social Ecological Model, Strategy, Web of Science

? Ferrier, S., Blanchard, C.M., Vallis, M. and Giacomantonio, N. (2011), Behavioural interventions to increase the physical activity of cardiac patients: A review. *European Journal of Cardiovascular Prevention & Rehabilitation*, **18** (1), 15-32.

Abstract: To examine the behaviour change techniques that have been used in physical activity (PA) interventions to increase PA during and after completing cardiac rehabilitation (CR) and for patients who do not attend CR (non-CR). Pub Med, PsychINFO, SPORTdiscus, Web of Science, Prowler and Cochrane databases were searched to identify studies that described an intervention delivered to adults in the CR and non-CR contexts that focused solely on promoting PA. Twenty-three studies (14 post-CR and nine non-CR) were included in this review. Findings showed that interventions can increase PA; however, there were notable differences across CR contexts in their purpose, the participant demographics, and some of the behaviour change techniques used. Techniques shown to be most effective in the post-CR context were self-monitoring, setting specific goals, identifying barriers and developing plans for relapse prevention. In the non-CR context, unsupervised home-based interventions were shown to be effective at increasing PA, particularly when accompanied by follow-up prompts, general encouragement, specific goals set by the researcher and self-monitoring. Post-CR and non-CR interventions can result in improved PA outcomes; however, the research in this area is limited. More interventions are needed that target PA-only, particularly in the non-CR context.

Keywords: Adherence, Adults, Barriers, Cardiac Rehabilitation, Cardiovascular Disease, Cochrane, Controlled-Trial, Coronary-Artery-Disease, Databases, Exercise, Exercise Maintenance, Follow-Up, Health, Heart-Failure, Intervention, Interventions, Mortality, Older-Adults, Outcomes, Physical Activity, Prevention, Pub Med, Rehabilitation, Rehabilitation Program, Research, Review, Science, Self-Management, Web of Science

# Title: European Journal of Clinical Investigation

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Subject Categories:

: Impact Factor

? Ioannidis, J.P.A., Tatsioni, A. and Karassa, F.B. (2010), Who is afraid of reviewers’ comments? Or, why anything can be published and anything can be cited. *European Journal of Clinical Investigation*, **40** (4), 285-287.

Full Text: [2010\Eur J Cli Inv40, 285.pdf](2010/Eur%20J%20Cli%20Inv40,%20285.pdf)

Keywords: Accuracy, Authorship, Decline, Journals, Peer Reviewers, Publication, Quality, Science, Self-Citation, Submission

? Mann, W.A. (2011), Treatment for prolactinomas and hyperprolactinaemia: A lifetime approach. *European Journal of Clinical Investigation*, **41** (3), 334-342.

Full Text: [2011\Eur J Cli Inv41, 334.pdf](2011/Eur%20J%20Cli%20Inv41,%20334.pdf)

Abstract: P>Background Prolactinomas are the most common hormone-secreting pituitary tumours and are amenable to medical therapy with dopamine agonists. Indication for treatment will most commonly result from hypogonadism, infertility or symptoms related to tumour size. Thus, both diagnosis and treatment will essentially depend on the patients’ stage of life, namely prepubertal, reproductive or postreproductive stage. This review will focus on a lifespan-dependent diagnosis and treatment for prolactinoma and hyperprolactinaemia. Methods PUBMED, the Cochrane Library, the Web of Science and EMBASE were searched electronically. No restriction was made with respect to language. Relevant current articles will be included in this review. Results Prevalence of prolactinomas and clinical symptoms are age group-specific, and treatment of first choice is dopamine agonists over the whole lifespan. Open questions in the treatment for hyperprolactinaemia include optimal choice and duration of pharmacological treatment. In addition, concerns have been raised on the safety of dopamine agonists since a reported association of valvular heart disease with dopaminergic treatment in patients with Parkinson’s disease. Conclusions Clinical presentation and consequences of hyperprolactinaemia and prolactinoma will differ in the specific stages of reproductive life and require an adequate lifetime-dependent diagnostic and therapeutic approach.

Keywords: Bromocriptine, Cabergoline Treatment, Cardiac-Valve Regurgitation, Clinical Manifestation, Clinical Presentation, Cochrane, Diagnosis, Disease, Dopamine Agonist Therapy, Dopamine Agonists, Embase, Heart-Disease, Hyperprolactinaemia, Medical, Methods, Natural-History, Paediatric Hyperprolactinaemia, Parkinson’S Disease, Postmenopausal Hyperprolactinaemia, Prolactinoma, Pubmed, Review, Safety, Science, Secreting Pituitary-Adenomas, Symptoms, Term-Follow-Up, Therapy, Transsphenoidal Surgery, Treatment, Tumours, Web of Science

? Handel, A.E., Lincoln, M.R. and Ramagopalan, S.V. (2011), Of mice and men: experimental autoimmune encephalitis and multiple sclerosis. *European Journal of Clinical Investigation*, **41** (11), 1254-1258.

Full Text: [2011\Eur J Cli Inv41, 1254.pdf](2011/Eur%20J%20Cli%20Inv41,%201254.pdf)

Abstract: Background Research using experimental autoimmune encephalitis (EAE) models accounts for almost 20% of the papers. published in multiple sclerosis (MS). Methods We performed a literature review of papers indexed with ISI Web of Science on EAE and MS over the last 30 years and a detailed analysis of studies of molecular pathways in EAE published in 2008 and 2009. Results The impact of EAE studies declines more rapidly than other studies published on MS (EAE cited corrected half-life = 4.00 years vs. MS cited corrected half-life = 9.66 years, P < 0.0001). The pathology of EAE differs quite markedly from that observed in the human disease. EAE has implicated many different genes as important to pathogenesis but only a minority of these are supported by human studies. Conclusions Future research should critically appraise precisely what is being modelled by EAE before drawing conclusions about human disease.

Keywords: Analysis, Animal-Models, B-Cells, Disease, Encephalomyelitis, Experimental, Experimental Autoimmune Encephalitis, Genes, Human, Impact, ISI, ISI Web of Science, Literature, Literature Analysis, Literature Review, Loci, Men, Methods, Modelling Complex Disease, Molecular, Multiple Sclerosis, Papers, Pathogenesis, Pathology, Research, Review, Science, T-Cell-Receptor, Therapy, Web of Science

# Title: European Journal of Clinical Microbiology & Infectious Diseases

Full Journal Title: [European Journal of Clinical Microbiology & Infectious Diseases](http://www.springerlink.com/content/101941/?p=edfb60662fde434db48536156e59a167&pi=0)

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Publisher: [Springer-Verlag Heidelberg](http://www.springerlink.com/app/home/main.asp?wasp=cmw7ypruqk7vneg2dr2p)

Publisher Address:

Subject Categories:

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Ramos, J.M., Gutiérrez, F., Masía, M. and Martín-Hidalgo, A. (2004), Publication of European Union research on infectious diseases (1991–2001): A bibliometric evaluation. *European Journal of Clinical Microbiology & Infectious Diseases*, **23** (3), 180-184.

Full Text: [E\Eur J Cli Mic Inf Dis23, 180.pdf](E/Eur%20J%20Cli%20Mic%20Inf%20Dis23,%20180.pdf)

Abstract: The study presented here analyzed the contents of 36 international infectious diseases journals from 1991 to 2001 to determine the number of reports prepared by authors in the European Union and to compare the per country scientific productivity. Articles included in the study were identified using the PubMed website. The number of publications in infectious disease journals produced by authors in the European Union experienced an exponential growth from 461 (19.2% of world production) in 1991 to 2,401 (35.9%) in 2001. The mean impact factor increased from 2.259 in 1991 to 3.001 in 2001. The leading countries in the total number of publications were the UK, France, and Germany. After taking population figures into account, Sweden, Denmark, and Finland headed the list, and after correcting for gross domestic product, the greatest producers were Sweden, Finland, and the UK. Overall, the scientific production and repercussion index of European Union research on infectious diseases experienced a notable rise during the last decade of the 20th century.

? Vergidis, P.I., Karavasiou, A.I., Paraschakis, K., Bliziotis, I.A. and Falagas, M.E. (2005), Bibliometric analysis of global trends for research productivity in microbiology. *European Journal of Clinical Microbiology & Infectious Diseases*, **24** (5), 342-345.

Full Text: [2005\Eur J Cli Mic Inf Dis24, 342.pdf](2005/Eur%20J%20Cli%20Mic%20Inf%20Dis24,%20342.pdf)

Abstract: In order to expand upon the limited literature estimating the quantity and quality of worldwide research production in the field of microbiology, a bibliometric analysis was conducted for the period 1995-2003 using the PubMed and Journal Citation Reports databases. By searching the “microbiology” category of the Journal Citation Reports database, a total of 74 journals were identified that were also included in PubMed. From these journals, a total of 89,527 articles were identified for analysis, and data on the country in which the research originated was available for 88,456 (98.8%) of them. The individual countries were separated into nine world regions. In terms of research production for the period studied, Western Europe exceeded all other world regions, with the USA ranking second. The mean impact factor was highest for the USA at 3.4, while it was 2.8 for Western Europe and 2.4 for the rest of the world combined. The research productivity per unit of expenditure for research and development was higher for Canada and Western Europe than for the USA. The three regions in which research productivity increased the most were Asia, Latin America, and Eastern Europe.

Keywords: Bibliometric, Bibliometric Analysis, Development, Eastern Europe, Impact Factor, Journal Citation Reports, Journals, Latin America, Microbiology, Pubmed, Research, Research and Development, Research Productivity, Science

? Ramos, J.M., Masía, M., Padilla, S. and Gutiérrez, F. (2009), A bibliometric overview of infectious diseases research in European countries (2002-2007). *European Journal of Clinical Microbiology & Infectious Diseases*, **28** (6), 713-716.

Full Text: [2009\Eur J Cli Mic Inf Dis28, 713.pdf](2009/Eur%20J%20Cli%20Mic%20Inf%20Dis28,%20713.pdf)

Abstract: This study analyses the distribution of papers published by authors from the European Union (EU) in 47 international infectious diseases journals from 2002 to 2007. The Web of Science of the Institute for Scientific Information was used to collect medical articles. From 46,149 papers recovered, 24,064 (52.1%) were from the EU. The EU15 countries published 23,239 papers (96.7%). The ten countries that joined the EU in 2004 published only 767 (3.2%) and the two countries that last joined the EU in 2007 contributed only 0.1% of the papers. The United States contributed 41.2% of the documents. The leading EU27 countries in number of publications were the United Kingdom, France, and Germany. After taking the population into account, Denmark, Sweden, and The Netherlands headed the list, and after correcting for gross domestic product the greatest producers were Malta, Estonia, and Sweden. In conclusion, the production of scientific papers on infectious diseases during the last six years was greater in the EU than in the United States. The contribution to the infectious diseases research of the 12 countries that joined the EU in the last few years has yet been limited.

Keywords: Authors, Bibliometric, Countries, European Union, Germany, Infectious Diseases, Journals, Medical, Papers, Publications, Research, Science, United Kingdom, Web of Science

# Title: European Journal of Clinical Nutrition

Full Journal Title: [European Journal of Clinical Nutrition](http://www.nature.com/ejcn/archive/index.html); [European Journal of Clinical Nutrition](http://web.ebscohost.com.ludwig.lub.lu.se/ehost/detail?vid=1&hid=111&sid=619b47f4-a3fb-4674-a0c7-9724c8b50a36%40sessionmgr111&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&jid=EUC)

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Publisher: Stockton Press

Publisher Address: Houndmills, Basingstoke RG21 6XS, Hampshire, England

Subject Categories:

Nutrition & Dietetics: Impact Factor

? Kung, A.W., Chan, L.W., Low, L.C. and Robinson, J.D. (1996), Existence of iodine deficiency in Hong Kong: A coastal city in southern China. *European Journal of Clinical Nutrition*, **50** (8), 569-572.

Full Text: Eur J Cli Nut50, 569.pdf

Abstract: OBJECTIVE: Iodine deficiency is a serious public health problem worldwide which is associated with mental retardation and cretinism. In view of a high incidence of transient neonatal hypothyroidism and a relatively high mean cord blood thyrotropin (TSH) concentration, a pilot study was carried out to analyse the urine iodine excretion in Hong Kong, a coastal city in the southern part of China.

DESIGN: Early morning urine was collected from healthy volunteers including children (n = 104), adults (n = 112) and elderly subjects (n = 349). A semi-quantitative questionnaire survey on the pattern of food intake was conducted in the adults and elderly.

RESULTS: 45.3% of the children, 51.7% of the adults and 55.3% of the elderly had urine iodine concentration below the criteria for iodine sufficiency (< 0.79 µmol/l). Iodine content in the drinking water and salt was low. A dietary survey revealed that seafood was not commonly consumed. 50-80% of the subjects never consumed high-iodine containing food such as seaweed, kelp or laver, and only 50% consumed seawater fish daily.

CONCLUSION: We confirmed that although Hong Kong is a non-goitrous area, iodine insufficiency exists. It is unsafe to assume that iodine deficiency does not exist in coastal urban areas.

Keywords: Iodine Deficiency, Hong Kong, Dietary Survey, Goiter

? Bonifacj, C., Gerber, M., Scali, J. and Daures, J.P. (1997), Comparison of dietary assessment methods in a southern French population: Use of weighed records, estimated-diet records and a food-frequency questionnaire. *European Journal of Clinical Nutrition*, **51** (4), 217-231.

Full Text: [1997\Eur J Cli Nut51, 217.pdf](1997/Eur%20J%20Cli%20Nut51,%20217.pdf)

Abstract: Objective: The main objective of the study was to develop appropriate dietary assessment instruments for the French Mediterranean region and to validate the measurements they provide.

Subjects and Methods: Three different assessment methods were submitted to a sample of 150 male and female volunteers. 98 completed the protocol, which consisted of a 4 d weighed dietary record (PETRA) and a 7 d estimated-diet record (S7) based on a check list and a set of photographs, both these records being completed once in each season of the year, and a semi-quantitative (standard portion) food-frequency questionnaire (FFQ) including questions eliciting socio-demographic and anthropometric data, which was completed once only. The days when PETRA was used to evaluate food consumption coincided with the first 4 d of S7 (S4).

Results: Validation was based on nutrients and foods. Energy-adjusted Pearson correlation coefficients between S4 and PETRA ranged from 0.32 for vitamin E to 0.81 for vitamin C (mean: 0.65 for 21 nutrients). There was practically no misclassification in opposite extreme quartiles. Spearman correlation coefficients ranged from 0.63 for fish and sea-food to 0.90 for wine (mean: 0.76 for 16 food groups). There was practically no misclassification in opposite extreme quartiles. De-attenuated energy-adjusted Pearson correlation coefficients between FFQ and S7 ranged from 0.22 for proteins and monounsaturated fatty acids to 0.80 for iron (mean: 0.45). 10% or less of subjects were misclassified in opposite extreme quartiles (except for vitamin C, 12%). Spearman correlation coefficients ranged from 0.25 for green-yellow-red raw vegetables to 0.76 for wine (mean: 0.42). 8% or less of subjects were misclassified in opposite extreme quartiles (except for citrus fruit, 11%). Conclusions: Portion estimation using the set of photographs was validated by the correlation between S4 and PETRA for both nutrients and foods. The FFQ provides a reasonably reliable measure of macronutrient intake and a good measure of micronutrient intake when compared with the data in the literature. It performs less well for food intake. Better results can be achieved for FFQ: (i) by using the set of photographs instead of standard portions and (II) by adding further questions on foods which are insufficiently covered.

Keywords: Dietary Assessment Methods, Validation, Foods, Macro-and Micronutrients, Breast-Cancer, Reproducibility, Validation, Validity, France, Models

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? Einarson, A. and Riordan, S. (2009), Smoking in pregnancy and lactation: A review of risks and cessation strategies. *European Journal of Clinical Pharmacology*, **65** (4), 325-330.

Abstract: Despite documented evidence of harm to fetus and infant, a substantial number of women continue to smoke during pregnancy and lactation. To examine the literature regarding smoking during pregnancy and breastfeeding to ascertain adverse effects as well as the efficacy of interventions to enable women to stop smoking in the perinatal period. A comprehensive literature search was undertaken to identify all published studies reporting on smoking in pregnancy and lactation. MEDLINE, EMBASE, PUBMED, and Web of Science databases were searched for studies published in English from 1966 to 2008 that reported on smoking in pregnancy and breastfeeding, with information on adverse effects and on all forms of smoking cessation, including behavioral interventions, nicotine replacement therapy, and pharmacotherapy such as antidepressants. There is evidence that smoking in pregnancy and lactation may cause many adverse affects in the perinatal period, childhood, and up to adulthood. These adverse effects include infertility, ectopic pregnancy, spontaneous abortion, placenta insufficiency, low birth weight, fetal growth restriction, preterm delivery, orofacial clefts, SIDS, craniosynostosis, clubfoot, childhood respiratory disease, attention deficit disorder, and some childhood cancers. A number of strategies have been developed to assist pregnant women in quitting smoking, including both behavioral interventions and pharmacological therapies, such as nicotine replacement and antidepressant therapy. Behavioral interventions report only modest success rates. Nicotine replacement therapy and antidepressants appear to be safe to use in pregnancy, but do not achieve a substantially higher success rate for quitting.

Keywords: Adverse Effects, Antidepressants, Attention, Behavioral Interventions, Bupropion, Cessation, Cigarette-Smoking, Databases, Disease, Disorder, Double-Blind, Efficacy, Embase, Fetal Growth, Information, Interventions, Literature, Maternal Smoking, Medline, Nicotine, Nicotine Patches, Perinatal, Pharmacotherapy, Pregnancy, Prevalence, Randomized Controlled-Trial, Review, Science, Smoking, Success, Therapy, Tobacco Smoking, United-States, Web of Science, Women

? Pitsouni, E., Alexiou, V., Saridakis, V., Peppas, G. and Falagas, M.E. (2009), Does the use of probiotics/synbiotics prevent postoperative infections in patients undergoing abdominal surgery? A meta-analysis of randomized controlled trials. *European Journal of Clinical Pharmacology*, **65** (6), 561-570.

Abstract: Background Advances in surgery have considerably lowered postoperative morbidity. However, infection remains a considerable morbidity factor. The aim of this review is to identify the potential benefit(s) of the perioperative administration of probiotics/synbiotics to patients undergoing abdominal surgery. Methods We searched PUBMED, Scopus, Web of Science, and Cochrane library to identify randomized controlled trials (RCTs) that studied the perioperative administration of probiotics/synbiotics to patients undergoing abdominal surgery. Results Nine RCTs studying 733 patients were included in our review. The incidence of postoperative pneumonia, cholangitis, and any infections as well as the duration of postoperative hospital stay and length of antibiotic therapy were lower among patients receiving probiotics than in the control group [six RCTs, 355 patients, odds ratio (OR) 0.24, 95% confidence interval (CI) 0.09-0.68; three RCTs, 209 patients, OR 0.18, 95% CI0.05-0.57; seven RCTs, 514 patients, OR0.26, 95% CI0.12-0.55; five RCTs, 313 patients, OR -2.70, 95% CI-5.15 to -0.25; four RCTs, 250 patients, OR -4.01, 95% CI-5.11 to -2.92, respectively], while the incidence of postoperative wound infection, urinary tract infection, intra-abdominal abscess, and mortality was not different between patients of the compared groups (six RCTs, 355 patients, OR0.52, 95% CI0.23-1.18; five RCTs, 313 patients, OR0.44, 95% CI0.04-5.54; four RCTs, 226 patients, OR0.44, 95% CI 0.12-1.59; nine RCTs, 685 patients, OR0.98, 95% CI0.29-3.29, respectively). Conclusion The use of probiotics/synbiotics may reduce postoperative infections after abdominal surgery. This is a promising infection-preventive measure that may decrease morbidity, length of antibiotic therapy, duration of hospital stay, and pressure for emergence of antimicrobial resistance. However, the results of this meta-analysis should be interpreted with caution due to the significant heterogeneity of the studies included.

Keywords: Abdominal Surgery, Antibiotic, Bacterial Translocation, Clinical-Trial, Cochrane, Complications, Control, Double-Blind Trial, Elective Surgical-Patients, Gut Barrier Function, Hepatectomy, Hospital, Infection, Infection-Preventive Measure, Lactobacillus-Rhamnosus Gg, Liver Resection, Meta-Analysis, Methods, Morbidity, Mortality, Postoperative Infections, Pressure, Probiotic Use, Probiotics, Probiotics, Synbiotics, Pubmed, Randomized Controlled Trials, Ratio, Resistance, Review, Science, Scopus, Surgery, Therapy, Tract, Web of Science

? Sheng, X., Wei, L., Murphy, M.J. and MacDonald, T.M. (2009), Statins and total (not LDL) cholesterol concentration and outcome of myocardial infarction: Results from a meta-analysis and an observational study. *European Journal of Clinical Pharmacology*, **65** (11), 1071-1080.

Abstract: The purpose of this study was to evaluate how total cholesterol (TC) concentration in subjects treated with statins predicts myocardial infarction (MI) risk in the absence of low density lipoprotein cholesterol (LDL-C) measurement in clinical trials and in the setting of usual care. A systematic review of published English language randomised clinical trials comparing statins with placebo that reported TC changes in subjects with or without prior MI between 1993 and 2008 was carried out using MEDLINE, the Cochrane Library, Web of Science and the ISI Web of Knowledge. In addition, a cohort study of MI patients who had at least two TC measurements in Tayside, Scotland, between 1989 and 2002 was performed. The main outcome was TC concentration changes and risk of subsequent MI. In the meta-analyses of secondary and primary prevention trials statins decreased TC by 1.54 mmol/L and 1.37 mmol/L versus placebo. Statin-associated TC reduction translated into a risk reduction of 18% per mmol (RR 0.82; 95%CI 0.72-0.93) for secondary prevention and 24% per mmol (RR 0.76; 95%CI 0.62-0.93) for primary prevention. In the cohort study, statin use reduced TC by 0.98 mmol/L compared with non statin-use. Statin use was associated with a 28% reduction (adjusted HR 0.72; 95%CI 0.51-0.98) for recurrent MI. Total cholesterol measurements can be used with confidence in the absence of LDL measurements to make decisions about statin drug introduction or titration. Randomised trials of statin therapy had good external validity and cholesterol changes and outcomes in trials were comparable to those observed in the setting of usual care.

Keywords: Artery-Disease, Atherosclerosis, Cardiac Events, Cardiovascular Events, Clinical Trials, Cochrane, Cohort Study, Coronary-Heart-Disease, Drug, Effectiveness, Isi, Knowledge, LDL, Measurement, Meta-Analysis, Myocardial Infarction, Outcome, Outcomes, Placebo-Controlled Trial, Pravastatin, Prevention, Primary, Primary Prevention, Progression, Randomized Controlled-Trial, Review, Risk, Risk Reduction, Science, Secondary Prevention, Statin Treatment, Statins, Systematic, Systematic Review, Therapy, Total Cholesterol, Total Cholesterol Concentration, Validity, Web of Knowledge, Web of Science

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: Impact Factor

? de Rooij, A., Vandenbroucke, J.P., Smit, J.W.A., Stokkel, M.P.M. and Dekkers, O.M. (2009), Clinical outcomes after estimated versus calculated activity of radioiodine for the treatment of hyperthyroidism: Systematic review and meta-analysis. *European Journal of Endocrinology*, **161** (5), 771-777.

Abstract: Background: Despite the long experience with radioiodine for hyperthyroidism, controversy remains regarding the optimal method to determine the activity that is required to achieve long-term euthyroidism. Objectives: To compare the effect of estimated versus Calculated activity of radioiodine in hyperthyroidism. Design: Systematic review and meta-analysis. Methods: We searched the databases MEDLINE. EMBASE. Web of Science, and Cochrane Library for randomized and nonrandomized Studies, comparing the effect of activity estimation methods with dosimetry for hyperthyroidism. The main outcome measure was the frequency of treatment success, defined as persistent euthyroidism after radioiodine treatment at the end of follow-up in the dose estimated and calculated dosimetry group. Furthermore, we assessed the Cure rates of hyperthyroidism. Results: Three randomized and live nonrandomized studies, comparing the effect of estimated versus calculated activity of radioiodine Oil Clinical Outcomes for the treatment of hyperthyroidism. were included. The weighted mean relative frequency of successful treatment outcome (euthyroidism) was 1.03 (95% confidence interval (CI) 0.91-1.16) for estimated versus calculated activity: the weighted mean relative frequency of cure of hyperthyroidism (eu- or hypothyroidism) wits 1.03 (95% CI 0.96-1.10). Subgroup analysis showed a relative frequency of euthyroidism of 1.03 (95% CI 0.84-1.26) for Graves’ disease and of 1.05 (95% CI 0.91-1.19) for toxic multinodular goiter. Conclusion: The two main methods used to determine the activity in the treatment of hyperthyroidism with radioiodine, estimated and calculated. resulted in an equally Successful treatment outcome. However, the heterogeneity of the included studies is it strong limitation that prevents it definitive conclusion from this meta-analysis.

Keywords: Analysis, Area, Cochrane, Databases, Disease, Drug-Therapy, Embase, Follow-Up, Frequency, Graves Hyperthyroidism, Hypothyroidism, Intelligent Design, Iodine Intake, Meta-Analysis, Methods, Outcome, Outcomes, Recurrence, Review, Science, Success, Systematic, Systematic Review, Term-Follow-Up, Treatment, Treatment Outcome, Web of Science

? Kokshoorn, N.E., Biermasz, N.R., Roelfsema, F., Smit, J.W.A., Pereira, A.M. and Romijn, J.A. (2011), GH replacement therapy in elderly GH-deficient patients: A systematic review. *European Journal of Endocrinology*, **164** (5), 657-665.

Abstract: Context: Recombinant human GH (rhGH) is prescribed for the treatment of adults with GH deficiency (GHD). However, conflicting data are available on the efficacy of rhGH treatment in elderly GHD patients. Objective: To assess the efficacy of rhGH treatment in elderly GHD subjects. Methods: We searched the available literature in PUBMED, Cochrane Library, Web of Science and EMBASE. Study selection: Studies on GHD patients, aged > 60 years, treated with rhGH were eligible for inclusion. Data extraction was performed by two reviewers independently. Results: We found 11 eligible studies with a total of 534 patients. Only two studies had prospective, randomized, placebo-controlled study designs of rhGH treatment with a duration of 6 (n = 15) and 12 months (n = 62), respectively. Treatment with rhGH decreased total and low density lipoprotein (LDL) cholesterol levels by 4-8 and 11-16%, respectively, but did not alter high density lipoprotein or triglyceride levels. RhGH did not affect body mass index, but decreased waist circumference (by similar to 3 cm) and waist/hip ratio. RhGh did not consistently affect blood pressure or bone mineral density. RhGH increased lean body mass by 2-5% and decreased total fat mass by 7-10% in four studies, but did not affect body composition in two other studies. RhGH consistently improved quality of life (QoL) parameters reflected in AGHDA-scores. There were no explicit data on elderly GHD patients aged > 80 years. Conclusion: RhGH replacement in elderly subjects with GHD decreases LDL cholesterol levels and improves QoL, but the effects on other parameters are not unequivocal. There were no data on the efficacy and safety of rhGH treatment in octogenarians with GHD.

Keywords: Adults, Aged, Blood, Blood Pressure, Blood-Pressure, Body Composition, Body Mass Index, Bone, Bone Metabolism, Bone Mineral Density, Cochrane, Efficacy, Elderly, Embase, Factor-I, Fat Mass, Growth-Hormone Replacement, Human, Hypopituitary Adults, Hypothalamic-Pituitary Disease, Improves Body-Composition, LDL, Life-Span, Literature, Methods, Muscle Strength, Parathyroid-Hormone, Pressure, Pubmed, Quality of Life, Ratio, Review, Safety, Science, Systematic, Systematic Review, Therapy, Treatment, Triglyceride, Web of Science

? Hazem, A., Elamin, M.B., Bancos, I., Malaga, G., Prutsky, G., Domecq, J.P., Elraiyah, T.A., bu Elnour, N.O., Prevost, Y., Almandoz, J.P., Zeballos-Palacios, C., Velasquez, E.R., Erwin, P.J., Natt, N., Montori, V.M. and Murad, M.H. (2012), Body composition and quality of life in adults treated with GH therapy: A systematic review and meta-analysis. *European Journal of Endocrinology*, **166** (1), 13-20.

Full Text: [2012\Eur J End166, 13.pdf](2012/Eur%20J%20End166,%2013.pdf)

Abstract: Objective: To summarise the evidence about the efficacy and safety of using GH in adults with GH deficiency focusing on quality of life and body composition. Data sources: We searched MEDLINE, EMBASE, Cochrane CENTRAL, Web of Science and Scopus through April 2011. We also reviewed reference lists and contacted experts to identify candidate studies. Study selection: Reviewers, working independently and in duplicate, selected randomised controlled trials (RCTs) that compared GH to placebo. Data synthesis: We pooled the relative risk (RR) and weighted mean difference (WMD) by the random effects model and assessed heterogeneity using the I 2 statistic. Results: Fifty-four RCTs were included enrolling over 3400 patients. The quality of the included trials was fair. GH use was associated with statistically significant reduction in weight (WMD, 95% confidence interval (95% CI): -2.31 kg, -2.66 and -1.96) and body fat content (WMD, 95% CI: -2.56 kg, -2.97 and -2.16); increase in lean body mass(WMD, 95% CI: 1.38, 1.10 and 1.65), the risk of oedema (RR, 95% CI: 6.07, 4.34 and 8.48) and joint stiffness (RR, 95% CI: 4.17, 1.4 and 12.38); without significant changes in body mass index, bone mineral density or other adverse effects. Quality of life measures improved in 11 of the 16 trials although meta-analysis was not feasible. Results: GH therapy in adults with confirmed GH deficiency reduces weight and body fat, increases lean body mass and increases oedema and joint stiffness. Most trials demonstrated improvement in quality of life measures.

Keywords: Adults, Adverse Effects, Body Composition, Body Mass Index, Bone, Bone Mineral Density, Bone-Mineral Density, Cardiac-Function, Cochrane, Efficacy, Embase, Endocrine-Society, Fat, Growth-Hormone Deficiency, Insulin Sensitivity, Japanese Patients, Joint, Medline, Meta Analysis, Meta-Analysis, Model, Muscle Strength, Patients, Placebo-Controlled Trials, Quality, Quality of Life, Recombinant Human GH, Reduction, Relative Risk, Replacement Therapy, Review, Risk, Safety, Science, Scopus, Synthesis, Systematic, Systematic Review, Therapy, Web of Science

# Title: European Journal of Epidemiology

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Public, Environmental & Occupational Health: Impact Factor 0.762, 61/85

? Morales Suárez Varela, M.M., Llopis Gonzalez, A. and Tejerizo Perez, M.L. (1995), Impact of nitrates in drinking water on cancer mortality in Valencia, Spain. *European Journal of Epidemiology*, **11** (1), 15-21.

Full Text: [1995\Eur J Epi11, 15.pdf](1995/Eur%20J%20Epi11,%2015.pdf)

Abstract: The concentrations of nitrates in public drinking water in the Mediterranean coastal province of Valencia are not only the highest in Spain but also in the whole of Europe. Intensive agricultural practices involve a traditional and growing use of nitrogen fertilizers. This and the terrain-poorly consolidated and porous in areas-favors the accumulation of nitrates in underground aquifers, thereby perhaps accounting for this contamination. The possible conversion of nitrates to nitrites under certain conditions of gastric achlorhydria, followed by their transformation to nitrosamines-substances known to be carcinogenic in experimental models-has led to a number of epidemiological studies of the possible relationship between high nitrate levels in public drinking water and mortality due to different cancers. The aim of the present study was to analyze the relationship between different levels of exposure to nitrates in the drinking water of the 258 municipalities in the province of Valencia and mortality due to cancer of the stomach, bladder, prostate and colon in this population. The cancer mortality rate was found to rise with increasing exposure to nitrates in the case of gastric cancer in both sexes, and in prostate cancer. These same results were obtained on calculating relative risk for the different age groups associated with the consumption of drinking water containing different levels of nitrates. (ABSTRACT TRUNCATED AT 250 WORDS).

Chu, N.F., Liou, S.H., Wu, T.N., Ko, K.N. and Chang, P.Y. (1998), Risk factors for high blood lead levels among the general population in Taiwan. *European Journal of Epidemiology*, **14** (8), 775-781.

Full Text: [E\Eur J Epi14, 775.pdf](E/Eur%20J%20Epi14,%20775.pdf)

Abstract: PURPOSE: Environmental and occupational lead pollution is a common problem in both developing and industrialized countries. The purpose of this study is to evaluate the risk factors for high blood lead levels among the general population in Taiwan.

METHODS: After multi-stage sampling, we randomly selected 2803 subjects (1471 males and 1332 females) for this study. Univariate and multivariate logistic regression analyses were conducted to evaluate the risk of high blood lead. To control for differences in age and gender, all analyses were with age-adjusted and gender-stratified.

RESULTS: Among males, the mean age is 46 years (15 to 85 years), mean and median blood lead levels is 7.3 and 6.3 microg/dl, respectively. Among females, the mean age is 43 years (15 to 84 years), mean and median blood lead level is 5.7 and 4.8 microg/dl, respectively. Among males, the history of herbal drug use, drinking water from well or spring sources, and occupational lead exposure are significantly different between relatively high and normal blood lead level subjects. The history of occupational lead exposure, history of herbal drug use, and well or spring sources of drinking water are the major risk factors for high blood lead with odds ratio of 4.62 (95% CI: 2.82-7.55), 3.09 (95% CI: 1.60-5.97), 2.06 (95% CI: 1.13-3.76), and 2.37 (95% CI: 1.39-4.04), respectively. Among females, these characteristics remain important except the sources of drinking water. The history of herbal drug use and occupational lead exposure become the major risk factors for high blood lead with odds ratio of 2.94 (95% CI: 1.26-6.88) and 7.72 (95% CI: 3.51-16.99), respectively. In multivariate logistic regression analyses, we find that the risk factors for high blood lead in both genders include a history of herbal drug use and occupational lead exposure. Among males, the drinking water sources and factories in the neighboring areas are also significant factors for high blood lead.

CONCLUSIONS: For the goal of reducing prevalence of high blood lead by the year, (2000), the improvement and monitoring of the working environment, the careful attention to herbal drug use and the lead-free drinking water sources should be executed as thoroughly as possible to reduce the probability of lead pollution.

García-López, J.A. (1999), Bibliometric analysis of Spanish scientific publications on tobacco use during the period 1970-1996. *European Journal of Epidemiology*, **15** (1), 23-28.

Full Text: [E\Eur J Epi15, 23.pdf](E/Eur%20J%20Epi15,%2023.pdf)

Abstract: Spanish scientific publications on tobacco use during the period 1970–1996 were studied, including all published work carried out in Spanish institutions indexed in IME or in MEDLINE and available on CD-ROM, using the search criteria fuma\* and taba\* in the first database, and tobacco and smoking in the second. A total of 405 papers were found by IME, published in Spanish journals, and another 194 in MEDLINE, published in foreign journals. In the latter database, a time-related increase in the number of papers was detected. Original articles accounted for 80.6% of the papers analyzed. The degree of collaboration between authors, research centres and institutions was 88.6%, 30.7% and 21.8%, respectively. The most productive Spanish communities were Catalonia and Madrid. The Spanish papers were published in 83 Spanish journals, of which 36 (43.4%) published just one paper, and in 124 foreign journals, of which 85 (68.5%) published a single paper. The average number of authors per paper was 4.02±2.46 in Spanish journals and 4.96±2.26 in foreign ones. The total number of authors was 1633, of whom 1162 (71.2%) appeared on a single paper. The contribution of Spanish scientific production concerning tobacco use, in international terms, has increased in recent years, but a higher level of cooperation between research centres and institutions is desirable.

Keywords: Authors, Bibliometrics, Journals, Papers, Spain, Tobacco

Lampi, P., Vohlonen, I., Tuomisto, J. and Heinonen, O.P. (2000), Increase of specific symptoms after long-term use of chlorophenol polluted drinking water in a community. *European Journal of Epidemiology*, **16** (3), 245-251.

Full Text: [E\Eur J Epi16, 245.pdf](E/Eur%20J%20Epi16,%20245.pdf)

Abstract: Chlorophenols contaminated the drinking water system and a local lake in the village of Jarvela in southern Finland. Period prevalence rates of symptoms, signs and diseases among the residents 15 years or older who responded (69%) to a survey in the contaminated area (1773 subjects) were compared with the rates of three uncontaminated areas (2018 subjects). Gastrointestinal and skin symptoms, in particular, were significantly (p < 0.05) more common in the contaminated area than in each control area. Nausea, general malaise, headache, anorexia, exceptional tiredness, and respiratory infections were significantly increased compared to the control areas combined. A dose-response was also observed: higher consumption of drinking water and contaminated fish further significantly increased (p < 0.05) reported symptoms. In conclusion, long-term use of chlorophenol polluted household water and fish can cause symptoms already familiar in connection with occupational chlorophenol exposures.

Keywords: Polychlorodibenzo-p-Dioxin, Pentachlorophenol Pcp, Exposure, Workers, Chloracne, 2,3,7,8-Tetrachlorodibenzo-Para-Dioxin, Dibenzofurans, Sediments, Seveso, TCDD, Chlorophenol, Population Health, Public Health, Water Pollution

? Jiang, Y., Ben, Q.W., Shen, H., Lu, W.Q., Zhang, Y. and Zhu, J. (2011), Diabetes mellitus and incidence and mortality of colorectal cancer: A systematic review and meta-analysis of cohort studies. *European Journal of Epidemiology*, **26** (11), 863-876.

Full Text: [2011\Eur J Epi26, 863.pdf](2011/Eur%20J%20Epi26,%20863.pdf)

Abstract: Increasing evidence suggests that a history of diabetes mellitus (DM) may be associated with an increased risk of colorectal cancer (CRC). To provide a quantitative assessment of the association between DM and risk of CRC, We evaluated the relation between DM and incidence and mortality of CRC in a systematic review of cohort studies. Full publications of cohort studies were identified in MEDLINE, EMBASE and Science Citation Index Expanded, through February 28, 2011. Summary relative risks (SRRs) with 95% confidence intervals (CIs) were summarized using a random-effects model. Between-study heterogeneity was assessed using the Cochran’s Q and I(2) statistics. A total of 41 cohort studies (35 articles) were included in this systematic review. Combining 30 cohort studies which presented results on diabetes and CRC incidence, diabetes was associated with an increased incidence of CRC (SRRs 1.27, 95% CI: 1.21-1.34), with evident heterogeneity among studies (P = 0.002, I(2) = 48.4%). Subgroup analysis and meta-regression analysis by controlling the confounders showed that the increased incidence of CRC was independent of geographic locations, sex, family history of colorectal cancer, smoking, physical activity and body mass index. Diabetes was also positively associated with CRC mortality (SRR 1.20, 95% CI: 1.03-1.40), with evidence of heterogeneity between studies (P < 0.001, I(2) = 81.4%). Results from this systematic review support that compared to non-diabetic individuals, diabetic individuals have an increased risk of CRC.

Keywords: Analysis, Assessment, Association, Blood-Glucose, Body Mass Index, Cancer, Citation, Cohort Studies, Colorectal Cancer, Confidence Intervals, Diabetes, Diabetes Mellitus, Embase, Epidemiologic Evidence, Family, Hepatocellular-Carcinoma, History, Incidence, Increased Risk, Insulin, Medline, Men, Meta Analysis, Meta-Analysis, Model, Mortality, Physical Activity, Physical-Activity, Population-Based Cohort, Publications, Quantitative, Review, Risk, Science, Science Citation Index, Sex, Smoking, Statistics, Systematic, Systematic Review, Type-2, Women

# Title: European Journal of Finance

Full Journal Title: European Journal of Finance

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JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Genest, C., Gendron, M. and Bourdeau-Brien, M. (2009), The advent of copulas in finance. *European Journal of Finance*, **15** (7-8), 609-618.

Full Text: [2009\Eur J Fin15, 609.pdf](2009/Eur%20J%20Fin15,%20609.pdf)

Abstract: The authors provide bibliometric evidence to illustrate the development of copula theory in mathematics, statistics, actuarial science and finance. They identify the main contributors to the field, and the most important areas of application in finance. They also describe some of the remaining methodological challenges.

Keywords: Bibliometric, Bibliometry, Copula, Derivative Pricing, Mathematics, Portfolio Management, Risk Management, Science, Statistics, Theory

# Title: European Journal of Gastroenterology & Hepatology

Full Journal Title: [European Journal of Gastroenterology & Hepatology](http://www.aidsonline.com/pt/re/aids/issuelist.htm;jsessionid=LzzLCytR37Xt2Gz11XrcnTHTlzx1BQTR20yb7QLmZCC7vKydgQhv!-1794658397!181195629!8091!-1)

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Publisher Address: 530 Walnut St, Philadelphia, PA 19106-3621

Subject Categories:

Gastroenterology & Hepatology: Impact Factor 1.598 48/71 (2010)

? Neuberger, J. and Counsell, C. (2002), Impact factors: Uses and abuses. *European Journal of Gastroenterology & Hepatology*, **14** (3), 209-211.

Full Text: [2002\Eur J Gas Hep14, 209.pdf](2002/Eur%20J%20Gas%20Hep14,%20209.pdf)

Abstract: Quantitative assessment of the scientific merit of journals and articles is being used increasingly to assess and compare researchers and institutions. The most commonly used measure is the 2 year Impact Factor, which broadly reflects the number of times each article in the journal has been cited over the previous 2 years. There are clear limitations to the use of such measures - not least, Impact Factors reflect the journal not the article, vary with time and correlate only poorly with perceived excellence. Simple comparison of impact factors in different specialties may be misleading. Review journals often have higher Impact Factors than those with original data. Both authors and editors can try to manipulate journal Impact Factors. However, despite valid concerns, Impact Factors are widely used and offer, at present, the best simple tool for comparison of output. Like all measures, the use of Impact Factors has to be tempered with knowledge of their limitations and common sense used in interpreting any data based on any analysis.

? Dhaliwal, S.K. and Hunt, R.H. (2004), Doctor-patient interaction for irritable bowel syndrome in primary care: A systematic perspective. *European Journal of Gastroenterology & Hepatology*, **16** (11), 1161-1166.

Full Text: 2004\Eur J Gas Hep16, 1161.pdf

Abstract: Background and aims Irritable bowel syndrome (IBS) is defined by specific validated symptom criteria and encompasses several different underlying pathophysiological mechanisms that express a common set of symptoms. However, IBS is poorly understood by patients. We aimed to explore how a diagnosis of IBS affects the interaction between patients and their physicians. Methods A comprehensive literature search for studies in the English language addressing this issue was conducted using MEDLINE, PUBMED, Cochrane Database, Psychinfo, Cinahl, EMBASE, Web of Science and manual recursive search of reference lists. Investigators reviewed and abstracted data from articles fulfilling our inclusion criteria: primary care patients, all ages, gender and ethnic groups diagnosed with IBS by a general practitioner (GP). Results Retrieval of 121 articles generated only four that met inclusion criteria, Research methods of three studies relied solely on qualitative subjective, anecdotal patient narratives, a bias in favor of patients’ negative opinion, absence of objective physician diagnostic criteria, pretesting questions for two studies, follow-up and patient verification of accounts for accuracy. The fourth study included objective physician diagnostic criteria, quantitative measures, a pre-testing questionnaire, and both patient and doctor perspectives. There was a disparity between patient and GP perception regarding the nature, severity and consequences of IBS in primary care, leading patients to perceive this interaction as one of dissatisfaction. The fourth study revealed GP management of IBS mostly meets patient’s expectations areas of concern centered on etiology, diagnostic criteria and dietary advice. Disparity seems to lie with the physician, who needs to provide more trust, knowledge, and sympathy, create rapport and be forthcoming with information, while keeping information simple and understandable. Patient dissatisfaction stems from the actual information provided and how this is communicated. Conclusions There is evidence that some IBS patients in primary care experience dissatisfaction and negative attitudes in GP interactions. Future research should take into account personality attributes and cross-situational stability in addition to methodological implications of studies. GPs may be the first avenue for IBS patients to vent their frustration, and appropriate education programs for optimal management of patients with IBS are needed in primary care. (C) 2004 Lippincott Williams Wilkins.

Keywords: Accuracy, Alternative Medicine, Bias, Cochrane, Diagnosis, Disparity, Doctor-Patient Interaction, Education, Etiology, Follow-Up, Gender, General Practitioner, Information, Irritable Bowel Syndrome, Knowledge, Literature, Management, Methods, Narratives, Perception, Physicians, Primary, Primary Care, Pubmed, Quantitative, Questionnaire, Research, Science, Symptoms, Systematic, Web of Science

? Baron, J.H. and Sonnenberg, A. (2002), Publications on peptic ulcer in Britain, France, Germany and the US. *European Journal of Gastroenterology & Hepatology*, **14** (7), 711-715.

Full Text: [2002\Eur J Gas Hep14, 711.pdf](2002/Eur%20J%20Gas%20Hep14,%20711.pdf)

Abstract: Objective There are no reasonable explanations for the increases first of gastric, and then of duodenal, ulcers in the second half of the nineteenth century. Previous studies have analysed hospital admissions, necropsies and mortality data. This paper uses a novel method, a study of the rates of increases in publications on these peptic ulcers over the centuries in four countries, the US and three in Europe. Methods Between 1700 and 1919 the Surgeon General’s Catalogues listed 2958 publications on gastric ulcer in Britain, France, Germany and the US, and between 1700 and 1929 1132 publications on duodenal ulcer. The published US cases of proven peptic ulcer in the nineteenth century were further analysed; details of sex, year of proven diagnosis and year of birth were available for 184 (90 male) cases of gastric ulcer and 77 (63 male) cases of duodenal ulcer. Results There were exponential increases in the number of monographs and articles on both types of peptic ulcer in the nineteenth century, and the curves for the four countries are remarkably similar. The increases in publications on gastric ulcer began about 1800 and for duodenal ulcer decades later. The number of cases of gastric ulcer diagnosed definitively in the US rose slowly in the first half of the nineteenth century and then increased markedly, with the increases in proven duodenal ulcer 1020 years later. The birth years of patients with gastric ulcer peaked for those born in the 1850s, and about 10-20 years later for patients with duodenal ulcer. Conclusion Such exponential increases are compatible with current models of infection with Helicobacter pylori but do not explain either the difference in timing between gastric and duodenal ulcer or the simultaneity between the four countries.

Keywords: Birth, Britain, Data, Diagnosis, Europe, First, France, Germany, Helicobacter Pylori, Hospital, Infection, Male, Models, Mortality, Nineteenth Century, Patients, Publications, Rates, Sex, Timing, US

? Suk, F.M., Lien, G.S., Yu, T.C. and Ho, Y.S. (2011), Global trends in *Helicobacter pylori* research from 1991 to 2008 analyzed with the Science Citation Index Expanded. *European Journal of Gastroenterology & Hepatology*, **23** (4), 295-301.

Full Text: [2011\Eur J Gas Hep23, 295.pdf](2011/Eur%20J%20Gas%20Hep23,%20295.pdf); [2011\Eur J Gas Hep-Suk.pdf](2011/Eur%20J%20Gas%20Hep-Suk.pdf)

Abstract: Objective In this study, we aim to evaluate the global scientific production of Helicobacter Pylori (H. pylori) research, study the characteristics of H. pylori research activities, and identify patterns, tendencies, and regularities of H. pylori-related articles. Methods Data were based on the online version of Science Citation Index Expanded, from the Web of Science database. Articles referring to H. pylori were assessed by the trend of publication output during 1991-2008, and analysis of the distribution of words in the article title, author keyword, and KeyWords Plus was carried out. Results Globally, 37451 papers were published during the 18-year study period, including 19 080 articles, 10 396 meeting abstracts, 2625 reviews, 1943 proceedings papers, and 1866 letters. There were totally 1727 journals listed in the 122 Science Citation Index subject categories. The mainstream research on H. pylori was in the clinical gastroenterology and hepatology, microbiology, and pharmacology and pharmacy fields. The G7 industrial countries held the majority of total world production. Research on the H. pylori-related topic ‘ulcer’ remained the hotspot of H. pylori research, whereas that on the related topic ‘gastric cancer’ increased during the 18-year study period. Conclusion With synthetic analysis of word in article title, author keyword, and KeyWords Plus, it can be concluded that application of H. pylori in clinical gastroenterology, especially research related to ‘cancer’ is the orientation of all the H. pylori research in the 21st Century. This bibliometric method can help relevant researchers understand the panorama of global H. pylori research, and establish the direction of further research. Eur J Gastroenterol Hepatol 23:295-301 (C) 2011 Wolters Kluwer Health vertical bar Lippincott Williams & Wilkins.

Keywords: Analysis, Application, Articles, Bibliometric, Bibliometric Analysis, Cancer, Characteristics, Citation, Clinical, Database, Distribution, Eradication, Gastric Cancer, Gastritis, Gastroenterology, Global, Helicobacter Pylori, Journals, Microbiology, Papers, Pharmacology, Pharmacy, Publication, Research, Research Trend, Reviews, Science, Science Citation Index, Science Citation Index Expanded, Scientific Production, Scientometrics, Trend, Trends, Trial, Version, Vertical, Web of Science, World

? Ge, Z.M., Ben, Q.W., Qian, J.B., Wang, Y.M. and Li, Y.M. (2011), Diabetes mellitus and risk of gastric cancer: A systematic review and meta-analysis of observational studies. *European Journal of Gastroenterology & Hepatology*, **23** (12), 1127-1135.

Full Text: 2011\Eur J Gas Hep23, 1127.pdf

Abstract: Aim Increasing evidence suggests that a history of diabetes may be involved in the development of various sites of cancer. However, the association of diabetes and risk of gastric cancer (GC) remains unclear. Methods We identified studies by a literature search of MEDLINE (from 1 January 1966), Web of Science (from 1 January 1994), and EMBASE (from 1 January 1974 through 31 May 2011), and by searching the reference lists of pertinent articles. All data were extracted independently by two investigators using a standardized data abstraction tool. Summary relative risks (SRRs) with 95% confidence intervals (CIs) were calculated with a random-effects model. Between-study heterogeneity was assessed using the Cochran’s Q and I(2) statistics. Results A total of 21 studies (four case-control studies, 17 cohort studies) were included in this meta-analysis. Analysis of these 21 studies found that compared with nondiabetic individuals, diabetic individuals had a similar risk of GC (SRRs, 1.09; 95% CI: 0.98-1.22). There was strong evidence of heterogeneity among these studies (P < 0.001, I(2) = 81.2%). A subgrouped analysis found that diabetic women had 18% increased risk of GC (SRRs, 1.18; 95% CI: 1.01-1.39), whereas it was not the case with diabetic men. No significant public bias was found in this study. Conclusion These findings of this systematic review indicate that compared with nondiabetic individuals, diabetic women have an 18% increased risk of GC development. However, diabetic men have a similar risk of GC. Eur J Gastroenterol Hepatol 23:1127-1135 (C) 2011 Wolters Kluwer Health | Lippincott Williams & Wilkins.

Keywords: Adenocarcinoma, Analysis, Association, Bias, Cancer, Case-Control, Case-Control Studies, Cohort Studies, Confidence Intervals, Development, Diabetes, Diabetes Mellitus, Embase, Expression, Gastric Cancer, Gastrointestinal Cancers, Glucose, Health, Helicobacter-Pylori Infection, History, Japanese, Korean Men, Literature, Medline, Men, Meta Analysis, Meta-Analysis, Methods, Model, Mortality, Observational, Observational Studies, Observational Study, Population-Based Cohort, Relative Risk, Review, Risk, Science, Smoking, Statistics, Systematic, Systematic Review, Web of Science, Women

# Title: European Journal of Gynaecological Oncology

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Obstetrics & Gynecology: Impact Factor 0.641, 59/61 (2008); Impact Factor 0.614, 60/70 (2009); Impact Factor 0.633, 64/75 (2010)

? Elit, L., Pal, T., Goshen, R., Jernstrom, H., Ackerman, I., Fyles, A., Carey, M., Mitchell, M., Aube, J. and Narod, S.A. (2002), Familial and hormonal risk factors for papillary serous uterine cancer. *European Journal of Gynaecological Oncology*, **23** (3), 187-190.

Abstract: Objectives: To identify genetic and non-genetic risk factors for papillary serous uterine cancer. Methods: A case-control study was conducted. Case women with papillary serous uterine cancer were compared with two control groups: 1) women with endometrioid uterine cancer and 2) healthy women with no past history of cancer. Cases and controls were matched for age (within two years) and ethnic group. All study subjects completed a questionnaire addressing family history. The cases and healthy controls were assessed for factors associated with estrogen exposure. Results: The risks of breast cancer (RR 1.84, Cl 1.03-331) and of prostate cancer (RR 2.21, CI 0.77-6.37) were higher among the relatives of patients with papillary serous uterine cancer, than among relatives of those with endometrioid uterine cancer. Other significant risk factors included weight at 18 years (p = 0.04) and the use of estrogen replacement therapy (p = 0.04). Conclusion: Relatives of women with papillary serous cancer of the uterus had an increased risk of breast and prostate cancer. Hormonal exposure also increases the risk for this cancer. These Findings suggest that predisposing genetic factors, possibly related to hormone metabolism, may be common to the three forms of cancer.

Keywords: Hormonal Risk Factors, Papillary Serous Uterine Cancer, Endometrial Cancer, Breast-Cancer, Carcinoma, Tamoxifen

? Lin, H.W., Yu, T.C. and Ho, Y.S. (2011), A systemic review of human papillomavirus studies: global publication comparison and research trend analyses from 1993 to 2008. *European Journal of Gynaecological Oncology*, **32** (2), 133-140.

Full Text: [2010\Eur J Gyn Onc32, 133.pdf](2010/Eur%20J%20Gyn%20Onc32,%20133.pdf)

Abstract: The term “human papillomavirus” has been used as the keyword during searching titles, abstracts, and keywords based on the online version of Science Citation Index (SCI), Web of Science from 1993 to 2008. Twelve document types were found among the 14,943 papers published in 1,072 journals that were listed in 99 SCI subject categories. All the articles referring to human papillomavirus were assessed by using the following aspects: characteristics of publication output, distribution of output in journals, publication output of source country, source institute, and analysis of word clusters in title, author keywords, and keywords plus. The results have shown that the USA ranked first using five publication indicators including total, single country, international, first author, and corresponding author publications. China has had the sharpest rise of publications since 2004. The top four European countries in 2008 were France. Germany, the UK, and Italy, respectively. Trend studies with word cluster analysis were performed with regards to the areas of immunology, screening methodology, behavioral sciences, economics, and meta-analysis. All those areas have shown a sharp upward rise since 2004. In addition, hypermethylation-induced inactivation of the p16 gene in the early stages of oncogenesis has been getting more interest in recent years.

Keywords: Analyses, Analysis, Bibliometric, Bibliometric Analysis, Cervical Cancer, Cervical-Cancer, Characteristics, China, Citation, Cluster, Cluster Analysis, Comparison, Controlled-Trial, Country, Distribution, Dna, Economics, First, France, Gene, Genital Tumors, Germany, Global, Human, Human Papillomavirus, Indicators, International, Italy, Journals, Meta-Analysis, Metaanalysis, Methodology, P53, Papers, Papillomavirus, Particle Vaccine, Publication, Publications, Recent, Research, Research Trend, Review, SCI, Science, Science Citation Index, Sciences, Screening, Sequences, Source, Term, Trend, Type-16, UK, USA, Version, Web of Science, Worldwide

# Title: European Journal of Heart Failure

Full Journal Title: [European Journal of Heart Failure](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6257&_auth=y&_acct=C000051951&_version=1&_urlVersion=0&_userid=1196840&md5=ebfc37b7737c14f21b62296f11b55589)

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JCR Abbreviated Title:

ISSN: 1388-9842

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Cleland, J.G.F., Swedberg, K., Cohen-Solal, A., Cosin-Aguilar, J., Dietz, R., Follath, F., Gavazzi, A., Hobbs, R., Korewicki, J., Madeira, H.C., Preda, I., van Gilst, W.H., Widimsky, J., Mareev, V., Mason, J., Freemantle, N. and Eastaugh, J. (2000), A survey on the quality of care among patients with heart failure in Europe. *European Journal of Heart Failure*, **2** (2), 123-132.

Full Text: [2000\Eur J Hea Fai2, 123.pdf](2000/Eur%20J%20Hea%20Fai2,%20123.pdf)

Abstract: Background: The EUROHEART programme is a rolling programme of cardiovascular surveys among the member nations of the European Society of Cardiology (ESC). These surveys will provide information on the nature of cardiovascular disease and its management. This manuscript describes a survey into the nature and management of heart failure. Aims: The EuroHeart Failure survey aims to describe the quality of hospital care, diagnostic and therapeutic, for patients with suspected or confirmed heart failure in ESC member countries. Patients will be interviewed subsequent to hospital discharge to assess their understanding of their condition, side effects from and their compliance with therapy and their satisfaction with the management for heart failure. The quality of management will be judged against the recommendations contained in the ESC guidelines on diagnosis and treatment of heart failure. Outcome will be further assessed by repeat interviews in 6-12 months time. A further survey of heart failure in 2001/2002 is also planned. Methods: A prospective survey of all deaths and discharges from medical (cardiology, internal medicine and geriatric medicine) and cardiac surgical wards to identify patients with heart failure, suspected or confirmed. Approximately 70 hospital clusters, comprising two to six hospitals in each cluster, in 24 member countries of the ESC are conducting the study. At the time of writing, approximately 30000 deaths and discharges have been screened and approximately 4000 patients have been enrolled. Conclusions: The EuroHeart Survey will allow actual practice to be compared to ESC guidelines on the diagnosis and treatment of heart failure. The surveys and guidelines should prove mutually informative. The main EuroHeart Failure project will be completed by late 2000. However, new centres volunteering to participate in the study (contact corresponding author) may he accepted providing they have the necessary research personnel and provided funding can hi: agreed fur statistical support anti administration. (C) 2000 European Society of Cardiology. All rights reserved.

Keywords: Heart Failure, Survey, Euroheart, Cardiac-Failure, Population, Diagnosis, Community, Etiology, Patterns, Echocardiography, Hospitalization, Inhibitors, Management

# Title: European Journal of Histochemistry

Full Journal Title: European Journal of Histochemistry

ISO Abbreviated Title: Eur. J. Histochem.

JCR Abbreviated Title: Eur J Histochem

ISSN: 1121-760X

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Journal Country/Territory: Italy

Language: English

Publisher: Luigi Ponzio E Figlio

Publisher Address: Via D Da Catalogna 1/3, 27100 Pavia, Italy

Subject Categories:

Cell Biology: Impact Factor

? Imamura, Y., Noriki, S., Tsuzuki, H., Nitta, Y. and Fukuda, M. (1993), Fluorescent staining of nucleolar organizer regions for three-dimensional display by confocal laser scanning microscope. *European Journal of Histochemistry*, **37** (4), 321-328.

Abstract: A new method of fluorescent staining of nucleolar organizer regions (F1NORs) is described. Aluminum ammonium sulfate was used instead of silver as the cationic metal ion for binding with NORs-associated proteins, and fluorescent morin was successively bound to aluminum by chelating with modification of the method developed by Malinin (1978). After bleaching the fluorescent staining of NORs by washing water, ordinary AgNORs staining was performed on the same section, and both images of F1NORs and AgNORs were found to coincide with each other. F1NORs staining of human malignant and benign tumors, and colorectal adenomas of borderline malignancy were examined by three-dimensional analysis of the fluorescence images under confocal laser scanning microscope (CLSM). A remarkable increase of F1NORs was found, not only in number but also in volume, with bizarre configuration in the process of tumor progression, and the F1NORs-CLSM technique may be helpful for daily pathological diagnosis of malignancy.

# Title: European Journal of Human Genetics

Full Journal Title: European Journal of Human Genetics

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Borry, P., Fryns, J.P., Schotsmans, P. and Dierickx, K. (2006), Carrier testing in minors: A systematic review of guidelines and position papers. *European Journal of Human Genetics*, **14** (2), 133-138.

Abstract: The objective of this article is to review all published normative ethical and clinical guidelines concerning the genetic carrier testing of minors. The databases MEDLINE, Philosopher’s Index, Biological Abstracts, Web of Science, and Google Scholar were searched using keywords relating to the carrier testing of children. We also searched the websites of the national bioethics committees indexed on the websites of WHO and the German Reference Center for Ethics in the Life Sciences, the Human Genetics Societies of various nations indexed on the website of the International Federation of Human Genetics Societies and related links, and the national medical associations indexed on the website of the World Medical Association. We retrieved 14 guidelines emanating from 24 different groups. All guidelines advanced the following preferences: (1) carrier testing should not be performed in children, and (2) testing should be deferred until the child can give proper informed consent to be tested. The guidelines varied in three areas: (a) the role of genetic services in ensuring that children are informed about their carrier status and associated risks when they are older; (b) exceptions to the general rule of withholding or deferring carrier testing; and (c) the communication of incidentally discovered carrier status. In the absence of compelling reasons, carrier testing of a child can reasonably be deferred until the child has the intellectual capacity needed to discern if and when to be tested.

Keywords: Bioethics, Carrier Testing, Child, Children, Clinical Guidelines, Communication, Databases, Disease, Ethical-Issues, Ethics, Genetic, Google Scholar, Guidelines, Human, Informed Consent, Medical, Minors, Papers, Review, Science, Systematic, Systematic Review, Web of Science, Websites, WHO

? Forrest, L.E., Delatycki, M.B., Skene, L. and Aitken, M. (2007), Communicating genetic information in families: A review of guidelines and position papers. *European Journal of Human Genetics*, **15** (6), 612-618.

Abstract: This article aims to review ethical and clinical guidelines and policies addressing the communication of genetic information in families. Websites of national and regional bioethics committees, national human genetics societies, international health organisations, genetic interest groups and legal recommendations committees were searched for guidelines and policies. The databases MEDLINE, Web of Science and Google Scholar were also utilised to search for additional guidelines relating to the communication of genetic information in families. The guidelines and policies included in this review are limited to those available in English. The search resulted in guidelines from 18 international, regional and national organisations from six countries pertaining to family communication of genetic information. The following ideals were common in their guidelines: (1) individuals have a moral obligation to communicate genetic information to their family members; (2) genetic health professionals should encourage individuals to communicate this information to their family members; and (3) genetic health professionals should support individuals throughout the communication process. The difference between the organisations’ guidelines was the inclusion of information about the role of the health professional in supporting clients during the process of communicating genetic information to their family members. Only two recommendations suggested that the health professional should support their clients by identifying at-risk family members, but more guidelines recommended that directive counselling should be undertaken to encourage clients to communicate genetic information to their family members. In conclusion, the guidelines provide an overview of the role that genetic health professionals may undertake; however, there are gaps that need to be addressed.

Keywords: At-Risk Relatives, Bioethics, Brca1, Breast, Cancer-Risk, Clinical Guidelines, Communication, Databases, Disclosure, Disease, Duty, Experience, Families, Genetic, Genetic Information, Genetics, Google Scholar, Guidelines, Human, Information, Interest, Members, Overview, Papers, Policies, Professional, Review, Science, Web of Science

# Title: European Journal of Information Systems

Full Journal Title: [European Journal of Information Systems](http://www.palgrave-journals.com/ejis/journal/v17/n2/index.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0960-085X

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Iivari, J. (2008), Expert evaluation vs bibliometric evaluation: Experiences from Finland. *European Journal of Information Systems*, **17** (2), 169-173.

Full Text: [2008\Eur J Inf Sys17, 169.pdf](2008/Eur%20J%20Inf%20Sys17,%20169.pdf)

Abstract: Research assessment can be based either on expert evaluation or bibliometric evaluation. This opinion paper evaluates pros and cons of these two approaches, concluding that they are complementary approaches. Therefore, they should be properly combined and synchronized to form an informative and cost-effective research assessment framework.

Keywords: Assessment, Assessment Framework, Bibliometric, Bibliometric Assessment, Bibliometric Evaluation, Complementary, Cost-Effective, Evaluation, Expert Assessment, Finland, Framework, Research, Research Assessment

? Powell, P. and Woerndl, M. (2008), Time to stop researching the important things? *European Journal of Information Systems*, **17** (2), 174-178.

Full Text: [2008\Eur J Inf Sys17, 174.pdf](2008/Eur%20J%20Inf%20Sys17,%20174.pdf)

Abstract: From 2010 government funding for UK research will be based partly on metrics. One of the key metrics will be citations, with research income and postgraduate student numbers also assessed. While citation metrics seem sensible, there is a serious issue of what topics one researches, the methods used and the way in which a move to the use of citations will induce a change in research behaviour - especially a move to the dull middle ground. This paper investigates the potential impact of such a move on niche areas of IS research - here research on small- and medium-sized enterprises. However, the arguments hold for any new, emerging, or non-mainstream research area. The impacts of citation metrics on publication outlets and research method choice are assessed.

Keywords: Behaviour, Choice, Citation, Citations, Enterprises, Funding, Government Funding, Impact, Impacts, Information-Systems, IS, Methods, Metrics, Niche, Potential, Publication, Research, Research Method, Small, Small- and Medium-Sized Enterprises, Student, UK

? Evangelopoulos, N., Zhang, X.N. and Prybutok, V.R. (2012), Latent Semantic Analysis: Five methodological recommendations. *European Journal of Information Systems*, **21** (1), 70-86.

Full Text: [2012\Eur J Inf Sys21, 70.pdf](2012/Eur%20J%20Inf%20Sys21,%2070.pdf)

Abstract: The recent influx in generation, storage, and availability of textual data presents researchers with the challenge of developing suitable methods for their analysis. Latent Semantic Analysis (LSA), a member of a family of methodological approaches that offers an opportunity to address this gap by describing the semantic content in textual data as a set of vectors, was pioneered by researchers in psychology, information retrieval, and bibliometrics. LSA involves a matrix operation called singular value decomposition, an extension of principal component analysis. LSA generates latent semantic dimensions that are either interpreted, if the researcher's primary interest lies with the understanding of the thematic structure in the textual data, or used for purposes of clustering, categorization, and predictive modeling, if the interest lies with the conversion of raw text into numerical data, as a precursor to subsequent analysis. This paper reviews five methodological issues that need to be addressed by the researcher who will embark on LSA. We examine the dilemmas, present the choices, and discuss the considerations under which good methodological decisions are made. We illustrate these issues with the help of four small studies, involving the analysis of abstracts for papers published in the European Journal of Information Systems. European Journal of Information Systems (2012) 21, 70-86. doi:10.1057/ejis.2010.61; published online 21 December 2010.

Keywords: Adoption, Analysis, Analysis Of Textual Data, Availability, Bibliometrics, Categorization, Clustering, Dimensionality, Factor Analysis, Family, Information, Information Retrieval, Information Systems, Information-Retrieval, Information-Systems, Interest, Journal, Model, Modeling, Nonnegative Matrix Factorization, Numerical Data, Papers, Primary, Principal Component Analysis, Profile, Recommendations, Researchers, Retrieval, Selection, Singular Value Decomposition, Text Mining, Unstructured Text

# Title: European Journal of Integrative Medicine

Full Journal Title: European Journal of Integrative Medicine

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zhong, Y.Q., Zhou, W., Jiang, H.L., Fan, T., Diao, X., Yang, H.M., Min, J., Wang, G., Fu, J.J. and Mao, B. (2011), Quality of reporting of two-group parallel randomized controlled clinical trials of multi-herb formulae: A survey of reports indexed in the Science Citation Index Expanded. *European Journal of Integrative Medicine*, **3** (4), E303-E310.

Full Text: [2011\Eur J Int Med3, E303.pdf](2011/Eur%20J%20Int%20Med3,%20E303.pdf)

Abstract: Introduction: An increasing number of trials of multi-herb formula interventions are being published in relatively high-ranked medical journals indexed in the Science Citation Index Expanded (SCIE). The aim of the study was to evaluate the quality of reporting of two-group parallel randomized controlled clinical trials (indexed in SCIE) of multi-herb formulae. Methods: Computerized literature searches were performed in SCIE from 1996 to November 2010. Two reviewers independently assessed the included trials using the modified Consolidated Standard of Reporting Trials (CONSORT) 2010 checklist and additional items reflecting the basic characteristics of traditional Chinese medicine (TCM). The number and proportion of reports describing each of the 38 modified CONSORT items and 6 additional TCM items were calculated. We also performed stratified analyses according to whether reports had or had not adopted the CONSORT statement, or according to Chinese reports (conducted in Mainland China, Hong Kong and Taiwan) or non-Chinese reports. Conclusions: The present study shows that the quality of reporting of these trials is suboptimal. We recommend all journals endorse the CONSORT statement, which would help researchers to improve the reporting of future randomized controlled trials. In addition, the reporting of the TCM items was considered inadequate in the included studies. All TCM practitioners should pay attention to the unique characteristics of TCM and improve the reporting of the recommended TCM items. (C) 2011 Elsevier GmbH. All rights reserved.

Keywords: Attention, China, Citation, Clinical Trials, Complementary, Consort, Consort Statement, Controlled Clinical Trials, Empirical-Evidence, Hong Kong, Interventions, Journals, Literature, Medical, Medical Journals, Medicine, Methods, Modified, Multi-Herb Formulae, Parallel, Placebo-Controlled Trials, Quality, Randomized Controlled Clinical Trials, Randomized Controlled Trials, Reporting Quality, Researchers, Science, Science Citation Index, Science Citation Index Expanded, Statement, Survey, Taiwan, Traditional, Traditional Chinese Medicine

# Title: European Journal of Internal Medicine

Full Journal Title: European Journal of Internal Medicine

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

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? Ray, A., Huisman, M.V., Tamsma, J.T., van Asten, J., Bingen, B.O., Broeders, E.A.B.J., Hoogeveen, E.S., van Hout, F., Kwee, V.A., Laman, B., Malgo, F., Mohammadi, M., Nijenhuis, M., Rijkee, M., van Tellingen, M.M., Tromp, M., Tummers, Q. and de Vries, L. (2009), The role of inflammation on atherosclerosis, intermediate and clinical cardiovascular endpoints in type 2 diabetes mellitus. *European Journal of Internal Medicine*, **20** (3), 253-260.

Abstract: Background: Type 2 diabetes mellitus (T2DM) is associated with increased cardiovascular morbidity and mortality. Sub-clinical systemic inflammation is often present in T2DM patients. Systemic inflammation has also been implicated in the pathophysiology of atherosclerosis. This review investigates the direct evidence present in literature for the effect of inflammation on atherosclerosis, specifically in the setting of T2DM. Special emphasis is given to the pathogenesis of atherosclerosis as well as intermediate and clinical cardiovascular endpoints. The important role of deteriorated endothelial function in T2DM was excluded from the analysis. Methods: Extensive literature searches were performed using the PUBMED and Web of Science databases. Articles were identified, retrieved and accepted or excluded based on predefined criteria. Results: Substantial evidence was found for an important inflammatory component in the pathogenesis of atherosclerosis in T2DM, demonstrated by inflammatory changes in plaque characteristics and macrophage infiltration. Most epidemiologic studies found a correlation between inflammation markers and intermediate cardiovascular endpoints, especially intima-media thickness. Several, but not all clinical trials in T2DM found that reducing sub-clinical inflammation had a beneficial effect on intermediate endpoints. When regarding cardiovascular events however, current literature consistently indicates a strong relationship between inflammation and clinical endpoints in subjects with T2DM. Conclusion: Current literature provides direct evidence for a contribution of inflammatory responses to the pathogenesis of atherosclerosis in T2DM. The most consistent relation was observed between inflammation and clinical endpoints. (C) 2008 European Federation of Internal Medicine. Published by Elsevier B.V. All rights reserved.

Keywords: Acute-Phase Reactants, Analysis, Articles, Atherosclerosis, C-Reactive Protein, Cardiovascular, Cardiovascular Events, Clinical Trials, Contribution, Coronary-Heart-Disease, Databases, Diabetes, Diabetes Mellitus, Endpoints, Epidemiologic Studies, Factor Intervention Trial, Inflammation, Intermediate Cardiovascular Endpoints, Intima-Media Thickness, Japanese Patients, Literature, Low-Grade Inflammation, Methods, Morbidity, Mortality, Myocardial-Infarction, Pathogenesis, Pubmed, Review, Risk-Factors, Science, Type 2, Type 2 Diabetes, Type 2 Diabetes Mellitus, Ubiquitin-Proteasome System, Web of Science

# Title: European Journal of International Management

Full Journal Title: [European Journal of International Management](http://inderscience.metapress.com/app/home/journal.asp?referrer=backto&backto=linkingpublicationresults,1:120713,1;&absoluteposition=2#A2)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

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Subject Categories:

: Impact Factor

? Collinson, S. and Rugman, A.M. (2010), Case selection biases in management research: the implications for international business studies. *European Journal of International Management*, **4** (5), 441-463.

Full Text: Eur J Int Man4, 441.pdf

Abstract: This paper reports on a bibliometric analysis of peer-reviewed articles in business and management studies, initially conducted in 2004 and repeated in 2009. It reveals that a small number of firms (11 in 2004) account for over 50% of the total ‘hit count’ for all firms in our list of the largest 200 multinationals. The major implication of this finding is that we gain most of our academic insights and our ‘best-practice’ lessons on management from a small, unrepresentative group of ‘exemplar’ companies. Seven case selection biases are identified, showing a disproportionate focus on a sub-set of firms that are: global and bi-regional; US-based; large; manufacturers; in dominant positions in important industries; long-terrn survivors; owners of strong brands. In this paper, we examine the first of these biases most closely. We conclude that business and management studies tend to overestimate the benefits and underestimate the difficulties of internationalisation.

Keywords: Bibliometric, Bibliometric Analysis, Case Method, Ease Study Selection Bias, Fashion, Inertia, Internationalisation, Knowledge, Multinational Firms, Research, Top 200 Firms

# Title: European Journal of Lipid Science and Technology

Full Journal Title: [European Journal of Lipid Science and Technology](http://www3.interscience.wiley.com/cgi-bin/jhome/69502350)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

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Subject Categories:

: Impact Factor

? Oterhals, A., Solvang, M., Nortvedt, R. and Berntssen, M.H.G. (2007), Optimization of activated carbon-based decontamination of fish oil by response surface methodology. *European Journal of Lipid Science and Technology*, **109** (7), 691-705.

Full Text: [2007\Eur Jou Lip Sci Tec109, 691.pdf](2007/Eur%20Jou%20Lip%20Sci%20Tec109,%20691.pdf)

Abstract: The effect of activated carbon (AC) adsorption on the reduction of persistent organic pollutants (POP) in fish oil was studied based on response surface methodology at a 5-g/kg AC inclusion level. Pretreatment of the oil by alkali refining and bleaching increased the POP levels. The tested process variables (contact time and temperature) affected the AC adsorption rate and significant first- and second-order response models could be established. Polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDD/F) showed a very rapid adsorption behavior and the concentration and toxic equivalent (TEQ) level could be reduced by 99%. Adsorption of dioxin-like polychlorinated biphenyls (DL-PCB) was less effective and depended on ortho substitution, i.e. non-ortho PCB were adsorbed more effectively than mono-ortho PCB with a maximum of 87 and 21% reduction, respectively, corresponding to a DL-PCB-TEQ reduction of 73%. A common optimum for both PCDD/F and DL-PCB adsorption could not be identified. AC treatment had no effect on the level of polybrominated diphenyl ether flame retardants. The differences in adsorption patterns may be explained based on molecular conformation. No change in oil quality could be observed based on oxidation parameters. Compliance with present PCDD/F and DL-PCB legislation levels in fish oil can be achieved based on AC adsorption.

Keywords: Activated Carbon, Adsorption, Adsorption Behavior, Adsorption Rate, Behavior, Biphenyls, Bleaching, Brominated Flame Retardants, Carbon, Concentration, Conformation, Contact Time, Contaminants, Decontamination, Dibenzo-p-Dioxins, Dioxin-Like PCBS, Dioxin-Like Polychlorinated Biphenyls, Dioxins, Effective, Farmed Atlantic Salmon, Fish, Fish Oil, Flame Retardants, Global Assessment, Inclusion, Legislation, Levels, Methodology, Models, Oil, Organic, Organic Pollutants, Oxidation, Parameters, PCB, Pcdd, F, Persistent, Persistent Organic Pollutants, Pollutants, Polybrominated, Polybrominated Diphenyl Ether, Polybrominated Diphenyl Ethers, Polychlorinated Biphenyls, Polychlorinated-Biphenyls, Polycyclic Aromatic-Hydrocarbons, Pop, Process, Quality, Rate, Reduction, Removal, Response Surface Methodology, Second Order, Surface, Temperature, TEQ, Time, Toxic, Toxic Equivalency Factors, Treatment, Vegetable-Oils

# Title: European Journal of Marketing

Full Journal Title: [European Journal of Marketing](http://www.emeraldinsight.com/Insight/viewContainer.do?containerType=Journal&containerId=82); [European Journal of Marketing](http://web.ebscohost.com.ludwig.lub.lu.se/ehost/detail?vid=1&hid=111&sid=d5c13523-1b5e-45b4-b5cf-dbfb80c52d55%40sessionmgr113&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=bth&jid=EJM)

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JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Gummesson, E. (2002), Practical value of adequate marketing management theory. *European Journal of Marketing*, **36** (3), 325-349.

Full Text: [E\Eur J Mar36, 325.pdf](E/Eur%20J%20Mar36,%20325.pdf)

Abstract: This is a critical discourse on marketing management textbooks and their presentations of general marketing theory. These books claim to be general, complete and upto-date, although the base of “textbook theory” is consumer goods mass marketing, a minority of all marketing if compared to services and B-to-B marketing. Seminal developments over the past decades in services marketing, quality management, relationship marketing and CRM are treated as special cases although they intervene in all types of marketing. The article claims that marketing management has become stereotyped on a derelict foundation in commodity-like textbooks. It ends with guidelines on how research in marketing could reinvent itself to the benefit of both academics and practitioners.

? Arnott, D.C. (2007), Research on trust: A bibliography and brief bibliometric analysis of the special issue submissions. *European Journal of Marketing*, **41** (9-10), 1203-1240.

Full Text: [2007\Eur J Mar41, 1203.pdf](2007/Eur%20J%20Mar41,%201203.pdf)

Abstract: Purpose - The primary purpose of this bibliography is to provide a compilation of trust-related articles from the disparate fields in which trust has been explored (from psychology to sociology and information systems to marketing. Years in its compilation and (still incomplete), it provides a listing that is not easily obtained even with the search capability of the internet and electronic library catalogues. Its secondary purpose is to highlight which articles are used most by marketing-related trust researchers both in general and within the submissions to the special issue. Design/methodology/approach - The bibliography was compiled via search and analysis of databases, reference lists, bibliographies, internet searches, library catalogues, university web pages, researchers’ curticula vitae (inter alia) for conference papers, journal articles, and books that use trust as a key concept within the work. Findings - The paper finds that there is a plethora of material on trust, but spread across several thousand sources. No single comprehensive collection exists and the need for such a compilation is of value to researchers. Research limitations/implications - The paper is an invaluable source of references on trust from across a wide range of academic disciplines. Originality/value - The main contribution of the paper is the cross-disciplinary nature of the compilation of reference materials.

Keywords: Bibliographies, Bibliometric Analysis, Journal Articles, Trust

? Calof, J.L. and Wright, S. (2008), Competitive intelligence - A practitioner, academic and inter-disciplinary perspective. *European Journal of Marketing*, **42** (7-8), 717-730.

Full Text: [2008\Eur J Mar42, 717.pdf](2008/Eur%20J%20Mar42,%20717.pdf)

Abstract: Purpose - The article aims to trace the origins of the competitive intelligence fields and to identify both the practitioner, academic and inter-disciplinary views on Cl practice. Findings - The paper presents a bibliometric assessment of the discipline. The findings reveal the representation of cross-disciplinary literature, which emphasises the multi-faceted role which competitive intelligence plays in a modern organisation. The analysis supports the view of competitive intelligence being an activity consisting dominantly of environmental scanning and strategic management literature. New fields of study and activity are rapidly becoming part of the competitive intelligence framework. Research limitations/implications - The analysis only uses ABI Inform as the primary sources for literature alongside Society of Competitive Intelligence Professionals (SCIP) and Competitive Intelligence Foundation (CIF) publications Practical implications - It is clear that today’s competitive intelligence practitioner cannot afford to rely on what they learned 20 years ago in order to ensure the continued competitive advantage of their firm. Originality/value - While there have been bibliographies of competitive intelligence literature, there have been few attempts to relate this to the three distinct areas of practice. This article is of use to scholars in assisting them to disentangle the various aspect of competitive intelligence and also to managers who wish to gain an appreciation of the potential which competitive intelligence can bring to marking and business success.

Keywords: Assessment, Bibliographies, Bibliometric, Bibliometric Assessment, Business, Competitive Analysis, Exploration, Forecasting, Foresight, Intelligence, Knowledge Management, Literature, Management, Marketing Intelligence, Marketing Intelligence, Performance, Publications, Research, Strategy

? Leonidou, C.N. and Leonidou, L.C. (2011), Research into environmental marketing/management: A bibliographic analysis. *European Journal of Marketing*, **45** (1-2), 68-103.

Full Text: [2011\Eur J Mar45, 68.pdf](2011/Eur%20J%20Mar45,%2068.pdf)

Abstract: Purpose - This study seeks to identify, synthesize, and evaluate extant research on environmental marketing and management, with the ultimate aim of unveiling trends in this field. Specifically, it aims to focus on: the characteristics of authors and manuscripts written on the subject; the methodological aspects of empirical studies, in terms of design, scope and methodology; and the thematic areas tackled, as well as the specific issues raised within each area. Design/methodology/approach - Relevant articles were identified using both electronic and manual bibliographic search methods. Altogether, 530 articles were identified in 119 academic journals published during the period 1969-2008. Each article was content-analyzed along six major dimensions, namely authorship profile, manuscript characteristics, research design, scope of research, research methodology, and topical area. Findings - Overall, it was revealed that this body of research has undergone a serious transformation, moving from an early stage of identification and exploration to a more advanced phase characterized by greater maturity and rigour. This is demonstrated by: the tendency for more multi-authored, cross-cultural, and inter-disciplinary collaborative efforts; the increasing length in manuscript size and number of references over time; the growing sophistication of research designs, gradually placing emphasis on formalized and causal structures; the expanded scope of research, covering a wide range of countries, industries, and products, as well as firms of different status, size, and geographic focus; the tendency to use probability sampling designs, obtain high response rates, secure large sample sizes, and apply advanced statistical analysis; and the great diversity and in-depth coverage of the topics examined. Research limitations/implications - Although a meta-analytical or bibliometric assessment could yield more quantitative insights, the fragmented nature of this type of research made the adoption of a bibliographic analysis a more appropriate approach. Various conceptual, methodological, and empirical implications are extracted from the study findings, while certain streams of research requiring further attention in the future were identified. Originality/value - Although research on environmental marketing/management has experienced an exponential growth in the last decades, as a result of intensifying government, public, and company concern, it has been criticised for being too fragmented, widely diverse, and non-programmatic to yield an all-round picture of trends in the subject. This study provides one of the few attempts to identify, consolidate, and evaluate extant knowledge on the subject in a systematic and integrative manner. In doing so, it would provide a reference point that could stimulate and guide future research on the subject, helping in this way the discipline’s theoretical advancement and practical development.

Keywords: Adoption, Analysis, Approach, Assessment, Authors, Authorship, Bibliometric, Bibliometric Assessment, Characteristics, Corporate Social-Responsibility, Coverage, Design, Development, Diversity, Ecologically Concerned Consumers, Empirical Studies, Environmental, Environmental Management, Field, Firm Performance, Growth, Identification, Integrative, Interdisciplinary, Journals, Knowledge, Length, Management, Marketing, Marketing-Strategy, Methodology, Methods, Natural-Environment, Organizational Capabilities, Product Development, Public, Rates, Reference, References, Research, Research Design, Resource-Based View, Sampling, Scope, Size, Statistical Analysis, Streams, Supply-Chain Management, Sustainable Development, Topical, Transformation, Trends

# Title: European Journal of Mineral Processing and Environmental Protection

EJMP&EP

Full Journal Title: [European Journal of Mineral Processing and Environmental Protection](http://www.ejmpep.com/journal.htm); [European Journal of Mineral Processing and Environmental Protection](http://web.ebscohost.com.ludwig.lub.lu.se/ehost/detail?vid=1&hid=111&sid=7bfec5ed-211e-48fe-adaa-40cb7526f752%40sessionmgr114&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&jid=R49); [European Journal of Mineral Processing and Environmental Protection](http://web.ebscohost.com.ludwig.lub.lu.se/ehost/detail?vid=1&hid=111&sid=c3c9e9a1-e4ec-4405-ae15-db0ae3de4346%40sessionmgr114&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=8gh&jid=R49)

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Habashi, F. (2001), Chemisorption of organic dyes on chrysotile asbestos and the toxicity issue. *European Journal of Mineral Processing and Environmental Protection*, **1** (1), 1-9.

Full Text: [E\EJMP&EP1, 1.pdf](E/EJMP&EP1,%201.pdf)

Abstract: Asbestos, an extremely useful natural resource, has been studied extensively mineralogically and for industrial application. Its extraction from ores has been greatly improved with respect to safety in the word place. In spite of that, there is a decisive effort in many countries to ban its use on the grounds that it is a toxic substance. This action resulting in drastic decrease in production and the possibility of destroying the industry. The chelation of asbestos with organic dyes seems to be a promising way to abate its toxicity. Dyeing can be done when the fibers are slurred in water at ambient conditions in the same way as textile fibers.

Keywords: Chemisorption, Organic dyes, Chrysotile Asbestos

? Halikia, I., Zoumpoulakis, L., Christodoulou, E. and Prattis, D. (2001), Kinetic study of the thermal decomposition of calcium carbonate by isothermal methods of analysis. *European Journal of Mineral Processing and Environmental Protection*, **1** (2), ??-??.

Full Text: EJMP&EP1, ??

Abstract: In the present study, isothermal methods of kinetic analysis are used to investigate the kinetics of the thermal decomposition of calcium carbonate. Thermogravimetric analyzer experiments were carried out in standard temperature values. In order to determine the decomposition mechanism and the conversion function form that governs it, four different methods of isothermal kinetic analysis were used. The kinetic model that was found to better fit the experimental results was that of phase boundary controlled reaction. The activation energy was evaluated from the Arrhenius plots, as well as by applying an alternative method, and the results confirmed the predominance of the chemical mechanism.

Keywords: Calcium Carbonate, Thermal Decomposition, Isothermal Methods, Kinetic Analysis, Decarbonisation

? Nebera, V.P. and Siolozhenkin, P.M. (2002), Biosorption and flotation biomass, loaded by precious or toxic metals. *European Journal of Mineral Processing and Environmental Protection*, **2** (3), ??-??.

Full Text: EJMP&EP2, ??

Abstract: Different microorganisms have been studied, capable to accumulate metals by their cells because of their resistivity to heavy metals. The separation of loaded biomass from the liquid by the filtration, frequentative flocculation, centrifuging has low effectivity. The most perspective is so named biosorbtive flotation. As sorbents can emerge biomasses of different microorganisms: bacteria, micromycetes, fungi, yeasts (baker’s, beer and forage), active silts and microalga. Scientific and practical urgency of problem consists in revealing an intercoupling between the sorption of non-ferrous and precios metals by the biomass and its floatability, determination optimal parameters of flotation biomass loaded by metals. This will allow to find basic role of polyvalent metals in hydrophobizing the surface of cells of microorganisms, and reveal new aspects of metals action at flotation separation biomasses of microorganisms, optimize technologies of extraction of metals from the dilute solutions and give concrete recommendations on bioflotation technologies of extraction of noble and non-ferrous metals.

Keywords: Biosorption, Bacteria, Micromycetes, Fungi, Yeasts, Alga, Metal Ions, Biomass Flotation

? Petrisor, I.G., Komnitsas, K., Lazar, I., Voicu, A., Dobrota, S. and Stefanescu, M. (2002), Biosorption of heavy metals from leachates generated at mine waste disposal sites. *European Journal of Mineral Processing and Environmental Protection*, **2** (3), ??-??.

Full Text: EJMP&EP2, ??

Abstract: In the present paper, the efficiency of adsorbents and biosorbents for the removal of metal ions and the clean up of leachates, generated at two Romanian mine waste disposal sites is examined. Several adsorbents such as activated charcoal, molecular sieve, shell sand, diatomite, bentonite, kaolin, as well as biosorbents such as xanthan biopolymer and waste biomasses are assessed, in terms of metal ion removal efficiency, in laboratory glass columns, comprising layers of coarse sand and 3 layers of each adsorbent/biosorbent. The effect of immobilized bacterial cells (naturally occurring consortia of acidophilic heterotrophic and chemolithotrophic bacteria) was also studied. The experimental results show that shell sand, molecular sieve and waste biomass have a relatively high efficiency in removing most heavy metal ions present in low pH leachates. Regarding shell sand and for the experimental conditions used, the selectivity follows the order Pb>As>Cd>Ni>Cu>Zn>Al>Co>Mn. From the two types of the isolated from leachates inoculum used as immobilized biomass, only heterothrophic acidophilic bacteria had a positive effect on metal uptake in contrary to chemolithotrophic acidophilic bacteria. The sufficient metal removal efficiency attained even without the use of immobilized bacteria, is mainly due to the stimulation of naturally occurring microbiota by addition of culture media, this stimulation may be considered as a feasible alternative to the use of immobilized cells in biosorption applications, regardless of the type of adsorbent/biosorbent used and the metal ion in concern.

Keywords: Biosorption, Shell Sand, Heavy Metals, Leachates

? Ebner, C., Pümpel, T. and Gamper, M. (2002), Biosorption of Cr(III) by the cell wall of *Mucor hiemalis*. *European Journal of Mineral Processing and Environmental Protection*, **2** (3), ??-??.

Full Text: EJMP&EP2, ??

Abstract: Biosorption of chromium(III) by whole cells and isolated cell walls of Mucor hiemalis was investigated. A fast initial sorption of Cr(III) on the cell wall was found, reaching 80% of the calculated maximum load after 30 min contact time. However, the final biosorption maximum could not be reached after two hours, indicating a complex binding mechanism comprising more than one sub-process. From the Langmuir-fitted biosorption isotherms theoretical maximum biosorption capacities of 132 and 22 mg Cr(III)/g d.w. were calculated for cell wall and whole cells, respectively. The composition of isolated cell walls was studied. The major components were chitosan (32%) and chitin (11%). The type of nitrogen source in the cultivation medium (NaNO3 and peptone from casein) strongly influenced the cell wall composition. The contents of chitosan and phosphorus in the cell wall were significantly higher with NaNO3 in comparison to peptone from casein, whereas a higher protein content was found using peptone. The biomass and extracted cell walls with higher contents of chitosan and phosphorus, deriving from the cultivation with NaNO3, showed an increased biosorption capacity for Cr(III). These results indicate that chitosan and phosphorus containing functional groups are the most probable binding sites for trivalent chromium in the cell wall, whereas proteins do not play a role in the biosorption of Cr(III) by Mucor hiemalis.

Keywords: Biosorption, Chromium, Cell Wall, Fungi, *Mucor Hiemalis*

? Lacher, C. and Smith, R.W. (2002), Sorption kinetics of Hg(II) onto *Potamogeton natans* biomass. *European Journal of Mineral Processing and Environmental Protection*, **2** (3), ??-??.

Full Text: EJMP&EP2, ??

Abstract: The kinetics of sorption of Hg(II) from aqueous solution onto the dead biomass of the aquaphyte *Potamogeton natans* was studied. Chemical and instrumental analyses including atomic absorption, electron microscopy and X-ray energy dispersion analyses were used to elucidate sorption mechanisms. It was found that, although sorption of Hg(II) took place over the entire biomass surface, there were spots on the surface where apparent multilayer sorption of Hg(II) occurred. Kinetic studies and the construction of various adsorption isotherms confirmed multilayer sorption at least on parts of the biomass. The maximum uptake of Hg(II) by *P. natans* biomass is about 180 mg/g biomass. The minimum concentration of Hg(II) in solution that can be achieved appears to be limited to about 4-5 mg/l. An attempt was made to determine whether or not the Hg(II) sorbed onto the biomass could be removed by elution with an acid or a base.

Keywords: *Potamogeton Natans*, *Biosorption*, *Mercury*, *Kinetics*

? Sağ, Y. and Akcael, B. (2002), Multi-metal biosorption equilibria of Cr(VI), Cu(II), Cd(II), and Fe(III) ions. *European Journal of Mineral Processing and Environmental Protection*, **2** (3), ??-??.

Full Text: EJMP&EP2, ??

Abstract: Four-component biosorption equilibria of Cr(VI), Cu(II), Cd(II), and Fe(III) ions were studied using *Rhizopus arrhizus*. As the multicomponent Langmuir model was able to predict the two ternary subsystems of these metal ions satisfactorily, it was further applied in describing the behavior of the quaternary metal systems. To present a summary of the effect of one metal on the uptake of the other, three-dimensional (3-D) sorption isotherm surfaces were constructed. The apparent equilibrium constant, the biosorption efficiency and the relative coverage of the four metals were in the order Fe³Cr>Cd>Cu.

Keywords: Four-Metal Biosorption, Chromium(VI), Copper(II), Cadmium(II), Iron(III), *Rhizopus arrhizus*, Multicomponent Langmuir Model

? Sharma, S., Dastidar, M.G. and Sreekrishnan, T.R. (2003), Biological removal of zinc from wastewater using *Aspergillus* sp. *European Journal of Mineral Processing and Environmental Protection*, **3** (1), 1-9.

Full Text: [2003\EJMP&EP3, 1.pdf](2003/EJMP&EP3,%201.pdf)

Abstract: The present study was conducted on removal of zinc in a continuous flow system by *Aspergillus* sp. during its growth. The fungal strain was isolated from industrial wastewater. The experiments under continuous culture conditions were performed in two reactors of working volume 650 ml and 3 litres respectively. The experiments were conducted using sugar concentrations of 10, 15 and 20 g/l and at dilution rates of 0.08, 0.04 and 0.02 h-1. Specific zinc uptake of 44 mg and 77mg per gram dry biomass were obtained in 650ml and 3 litres reactors, at 10g/l sugar concentration and 0.02 h-1 dilution rate. No significant increase was observed in the specific zinc uptake with increase in sugar concentration. The specific uptake of zinc increased to 79 mg/g of dry biomass at 15 g/l sugar concentration and to 84mg/g of dry biomass at the same sugar concentration but with proportional increase in nutrient components . At higher initial concentration (1000 mg/l) of zinc, the specific zinc uptake by the fungus was found to be 120 mg/g of dry biomass at 10 g/l sugar concentration. Further studies using an actual industrial effluent having zinc concentration of 46 mg/l resulted in a complete removal of the metal at 10 g/l sugar concentration.

Keywords: Zinc, *Aspergillus* sp., Specific Metal Uptake, Continuous Flow System

? Lodi, A. Solisio, C. and Converti, A. (2003), Influence of the hydration degree on copper removal by *Spirulina platensis* biomass. *European Journal of Mineral Processing and Environmental Protection*, **3** (1), 9-15.

Full Text: [2003\EJMP&EP3, 9.pdf](2003/EJMP&EP3,%209.pdf)

Abstract: In the present work, hydrated biomass of *Spirulina platensis* has been used for copper removal from aqueous solutions. Biomass has firstly been characterised by potentiometric titration and the overall ionic content evaluated. Copper uptake experiments have been carried out using powdered dry biomass of this cyanobacterium, preliminarily hydrated for increasing time, namely 0, 24, 48, 72 and 96 h. Titration experimental data suggest that biomass contains two main acidic groups and total specific negative charge of about 0.4meq/g biomass. The total amount of metal cations released by biomass indicates a metal adsorption capacity of 0.79 meq/g. Adsorption tests have evidenced an increase in copper removal capacity of biomass induced by its pre-hydration, likely due to the fact that the contact with water was able to swell up dry biomass so as to expose to the outside a significant number of sites available for adsorption. A hydration time of 48h appears to be the best condition of *S. platensis* biomass pre-treatment for copper removal.

Keywords: *Spirulina* *Platensis*, Adsorption, Copper Removal, Hydration

? Say, R., Yilmaz, N. and Denizli, A. (2003), Removal of chromium(VI) ions from synthetic solutions by the fungus *Penicillium canescens*. *European Journal of Mineral Processing and Environmental Protection*, **3** (1), 36-42.

Full Text: [2003\EJMP&EP3, 36.pdf](2003/EJMP&EP3,%2036.pdf)

Abstract: *Penicillium canescens* has demonstrated the ability to bind high amount of chromium(VI) from aqueous solutions. Cr(VI) adsorption capacity increases with the time during the first 4 h and then levels off toward the equilibrium adsorption capacity. Biosorption of Cr(VI) ions reached equilibrium in 4h. Cr(VI) ions binding Penicillium canescens was clearly pH dependent. Cr(VI) loading capacity increased with increasing pH under acidic conditions, presumably as a function of Cr(VI) speciation and due to the H+ competition at same binding sites. The adsorption of Cr(VI) ions reached a plateau value at around pH 6.0. The maximum adsorption capacity of Cr(VI) ions onto the fungal biomass was 34.8mg/g. Elution of Cr(VI) ions was performed using 0.5M HCl. The fungus Penicillium canescens could be used for six cycles for biosorption.

Keywords: Cr(VI), Fungal Biomass, Heavy Metal-Binding, Biosorption, *Penicillium Canescens*

? Bal, Y., Bal, K.E. and Lallam, A. (2003), Removal of Bi(III) and Zn(II) by nonliving *Streptomyces rimosus* biomass from nitric solutions. *European Journal of Mineral Processing and Environmental Protection*, **3** (1), 42-49.

Full Text: [2003\EJMP&EP3, 42.pdf](2003/EJMP&EP3,%2042.pdf)

Abstract: The study reports the Bi3+ and Zn2+ species sorption onto various adsorbents from nitric synthetic solutions, a typical representative of waste effluents derived from non valid drugs lixiviate. Solid-liquid batch experiments carried out at 25°C to assess the adsorptive capacity of the sorbents indicate that nonliving Streptomyces rimosus biomass uptakes the metal species from solutions containing up to 100mg/l, at pH 1.9, at relatively fast kinetics. The biosorbent was loaded with about 7mg/g of Bi3+ and 15mg/g of Zn2+ after 2 hours contact time. Similar results were obtained with the mineral active carbon and the C25 strong cation exchanger. It was also found that prior treatment of the biosorbent with dilute solution of NaOH improved the sorption capacity of Bi3+ to up to 10mg/g. F.T.I.R spectra of the biomaterial gave bands which were assigned to potential binding groups of the amide I and amide II types, primary alcohol at C-6 and secondary alcohol at C-3. Characteristic related peaks were respectively observed at 3272-2950-2923, 1621-1536, 1010 and at 1409cm-1. When adsorbed, both metal ions were quantitatively eluted and the biosorbent material regenerated by aqueous solutions of NaCl, 10g/l. Elution of Bi3+ ion was also obtained with nitric solution of Zn2+, 1g/l.

Keywords: Biosorption, *Streptomyces Rimosus*, Bi3+, Zn2+

? Vegliò, F. (2003), Modelling of equilibrium heavy metal biosorption data at different pH: a possible methodological approach. *European Journal of Mineral Processing and Environmental Protection*, **3** (1), 49-58.

Full Text: [2003\EJMP&EP3, 49.pdf](2003/EJMP&EP3,%2049.pdf)

Abstract: In this paper a methodological approach to study and model equilibrium of heavy metals during biosorption has been proposed and discussed. Two cases of copper biosorption are reported as examples: biosorption of copper onto Sphaerotilus natans and copper adsorption onto calcium alginate. Different empirical and semi-empirical models have been proposed and summarised, to consider the pH effect on heavy metal up-take. The proposed models, originated from Langmuir isotherm, may be useful to fit experimental data by just monitoring the pH avoiding thus its control. The adsorption isotherms were built considering experimental procedures at constant pH and pH edge conditions. Both empirical and semi-empirical models were able to fit these experimental results. The empirical approach can be applied in single cases considering the selected experimental results, whereas the proposed semi-empirical models seem to be more generally applicable. Although the validity of these last models should be checked also in other cases, this approach may be useful to describe and fit biosorption data in a single metal system during the building of an adsorption isotherm: the simple equilibrium pH monitoring during the tests (also carried out in pH-edge conditions) and the introduction of this factor as independent variable in the equilibrium modelling is suggested as methodological approach to study biosorption in a single metal system. The use of these models may be useful also in successive studies in which the experimental results are described by mechanistic models (like Surface Complex Model - SCM) permitting a right interpolation of the data. The results are not conclusive because the effect of some important factors as biomass concentration and presence of other ions in solution are not considered in these models.

Keywords: Biosoprtion, Heavy Metals, Equilibrium, Modelling, pH-Effect

? Cabuk, A. and İlhan, S. (2003), Cu2+ removal in a biosorption column by immobilized bacterial biomass. *European Journal of Mineral Processing and Environmental Protection*, **3** (1), 67-75.

Full Text: [2003\EJMP&EP3, 67.pdf](2003/EJMP&EP3,%2067.pdf)

Abstract: Removal of excess heavy metal ions from waste waters is essential due to their extreme toxicity towards aquatic life and humans. Microorganisms are being increasingly studied for the removal of heavy metal ions from aqueous solution. In this study, bacterial biomass, which was isolated from soil beforehand, was identified as *Bacillus subtilis*. Then the bacterial biomass was immobilized in agar and polyacrylamide gel. The immobilized particles packed in a column were used to remove Cu2+. The effects of the immobilization method, bed-length, flow rate and initial metal concentration on performance of the Cu2+ removal by the fixed bed columns were systematically investigated. The highest Cu2+ uptake efficiency 58.0% (Yi) was obtained by Bacillus subtilis immobilized on agar, 10cm bed length, 180ml h-1 flow rate and 100mg l-1 initial Cu2+ concentration. This research showed that *Bacillus subtilis* had a potential to be used in removal of Cu2+ from waste waters. Freundlich constants were determined from the Freundlich adsorption isotherms.

Keywords: Immobilized Cells, Biosorption, Waste Water, Copper Removal, *Bacillus Subtilis*

? Niu, H. and Volesky, B. (2003), Biosorption mechanism for anionic metal species with waste crab shells. *European Journal of Mineral Processing and Environmental Protection*, **3** (1), 75-88.

Full Text: [2003\EJMP&EP3, 75.pdf](2003/EJMP&EP3,%2075.pdf)

Abstract: Biosorption of anionic metal species such as gold-cyanide, chromate and anionic vanadate species by acid-washed Ucides shells (AWUS) mainly involved anions binding on the positively charged amide groups of the AWUS. The binding force may relate to electrostatic attraction. No significant reduction of the selected metals was observed in the biosorption systems with AWUS. All selected metals were observed bound on AWUS at their respective original valent states, i.e. Au(I), Cr(VI) and V(V). Anionic metal species biosorption takes place through a combination of ion-exchange and adsorption. In the case of vanadate, the binding mechanism might involve other mechanism(s) in addition to the above ones.

Keywords: Biosorption, Anionic Metal Complexes, Crab Shells, Chitin-Containing Materials, Chemical Speciation

? Machado, R., Santos, C., Correia, M.J.N. and Carvalho, J.R. (2003), Biosorption of copper by grape stalks and pine bark biomasses. *European Journal of Mineral Processing and Environmental Protection*, **3** (1), 108-118.

Full Text: [2003\EJMP&EP3, 108.pdf](2003/EJMP&EP3,%20108.pdf)

Abstract: The removal of copper from aqueous solutions by biosorption onto grape-stalks and pine bark biomass is reported. The adsorption isotherms were determined, along with the effect of different variables, such as the pre-treatment of the biomass, pH, metal concentration and reaction time on the copper removal efficiency. The uptake capacity for copper with grape stalks and with pine bark is 19.9 mg/g and 49.8 mg/g, respectively. In both cases, the biosorption is favoured by an increase in pH. The pre-treatment of the pine bark with a solution containing 0.005M of calcium chloride increases 20% its uptake capacity. The kinetics of copper biosorption in both biomasses was studied and a pseudo second order model was used to fit the experimental data. Copper biosorption is a fast process and within the first 2 minutes 80% of the metal is removed from the solution. The elution experiments shows that all the copper bound to the grape stalks could be eluted using a solution containing 1 molar of sodium sulphate and 0.1 M of tri-sodium citrate, and no more than 84% (maximum) of the copper bound to pine bark could be eluted using an acid solution of H2SO4 3.7 M. The biomasses did not loose their binding capacity for, at least, four cycles of biosorption/elution.

Keywords: Grape Stalks, Pinus-Bark, Biosorption, Elution

? Chu, K.H. (2003), Prediction of two-metal biosorption equilibria using a neural network. *European Journal of Mineral Processing and Environmental Protection*, **3** (1), 119-128.

Full Text: [2003\EJMP&EP3, 119.pdf](2003/EJMP&EP3,%20119.pdf)

Abstract: A feedforward neural network model with a single hidden layer was used to correlate and predict biosorption equilibrium data in a binary metal system. Experimental data on the biosorption of Fe(III) and Cr(VI) by the microalga *Chlorella vulgaris* reported in the literature was used to assess the performance of the neural network. It was demonstrated that the neural network approach was significantly more accurate than the traditional modeling approach based on Langmuir-type models. To assess the predictive capability of the neural network model, the network was trained using a subset of available data. The suitably trained neural network was found to be capable of predicting fresh data not belonging to the training set. However, training data should be selected carefully if the best results are to be achieved.

Keywords: Artificial Neural Network, Biosorption, Equilibrium Isotherm, Modeling

# Title: European Journal of Neurology

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? Pan, P.L., Song, W. and Shang, H.F. (2012), Voxel-wise meta-analysis of gray matter abnormalities in idiopathic Parkinson’s disease. *European Journal of Neurology*, **19** (2), 199-206.

Full Text: 2012\Eur J Neu19, 199.pdf

Abstract: Structural neuroimaging studies on idiopathic Parkinsons disease (IPD) with voxel-based morphometry (VBM) yielded variable and conflicting findings. A systematic review of VBM studies of patients with IPD and healthy control (HC) subjects published in PubMed, ISI Web of Science, Embase, and Medline databases from 1995 to 25 October 2010 was conducted. Coordinates were extracted from clusters of significant gray matter (GM) difference between patients with IPD and HC subjects. Meta-analysis was performed using signed differential mapping. A total of 17 VBM studies involving 498 patients with IPD and 375 HC subjects met the inclusion criteria. A significant regional GM volume decrease was detected in the left inferior frontal gyrus (BA47) extending to the left superior temporal gyrus (BA38) and the left insula (BA13) of patients with IPD compared with HC subjects. The findings of this study remain largely unchanged in quartile and jackknife sensitivity analyses and in subgroup analyses. Robust GM reductions in the inferior frontal/orbitofrontal gyrus (BA47) are implicated in IPD, and the reductions may be related to the mediation of the non-motor IPD symptoms, such as cognitive, emotional, and autonomic functions. Further studies must be conducted to determine whether the findings are specific to all IPD subtypes or different from the atypical Parkinsonism.

Keywords: Basal Ganglia, Cerebral Atrophy, Cognitive Impairment, Control, Databases, Decision-Making, Disease, Gray Matter, Idiopathic Parkinson’s Disease, IPD, ISI, ISI Web of Science, Lewy Bodies, Magnetic Resonance Imaging, Mapping, Medline, Meta Analysis, Meta-Analysis, Morphometry, Nonmotor Symptoms, Orbitofrontal Cortex, Parkinson’s Disease, Patients, Prefrontal Cortex, Pubmed, Review, Science, Sensitivity, Signed Differential Mapping, Symptoms, Systematic, Systematic Review, Vbm, Voxel Based Morphometry, Voxel-Based Morphometry, Web of Science, Web-of-Science, Whole-Brain

# Title: European Journal of Nuclear Medicine

Full Journal Title: [European Journal of Nuclear Medicine](http://www.springerlink.com/(ujztwa55u3ygzu454czmcj45)/app/home/journal.asp?referrer=backto&backto=linkingpublicationresults,1:100414,1;&absoluteposition=58#A58)

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? Mijnhout, G.S., Hooft, L., van Tulder, M.W., Deville, W.L.J.M., Teule, G.J.J. and Hoekstra, O.S. (2000), How to perform a comprehensive search for FDG-PET literature. *European Journal of Nuclear Medicine*, **27** (1), 91-97.

Full Text: [2000\Eur J Nuc Med27, 91.pdf](2000/Eur%20J%20Nuc%20Med27,%2091.pdf)

Abstract: In this study, a comprehensive, unbiassed search strategy for identifying literature on fluorine-18 fluorodeoxyglucose positron emission tomography (FDG-BET) in Medline, Embase and Current Contents was developed, with specific search strategies for each database, using MeSH terms as well as free text words for PET and FDG. To examine which text words apply to FDG, we evaluated the ways of spelling FDG in a random sample of FDG-PET articles (n = 100). These words were used as free text words in the two databases and overlap was determined. PET publications were identified using the text words “positron emission tomography” and “Pet$” Combined with the respective MeSH terms for each database. To compare the yield of the combined FDG-PET strategy in each database, the retrieved citations were downloaded to Pro-Cite 4.0. Final ly, we added search terms for lung cancer, breast cancer, melanoma, head and neck cancer and lymphoma to our strategy and to a short strategy (consisting of the text words “positron emission tomography” and “fdg”). In order to measure the yield and precision (positive predic- tive value, PPV) of our search strategy and compare it with the short one, we screened the title and abstract of the retrieved citations. Reviewing a random sample of the FDG-PET literature yielded 56 different ways of spelling FDG. We confined the list to 11 text words, without missing articles. Of the publications retrieved by these text words, only 4% were indexed by the MeSH term “Fludeoxyglucose F18” in Medline and 29% by the MeSH-term “Fluorodeoxyglucose F18” in Embase, Only 51% of PET articles were indexed by the MeSH term “Tomography, emission-computed” in Medline and 40% by the MeSH term “Positron emission tomography” in Embase. The combined search strategy for identifying studies on FDG and PET resulted in 2865 publications in Medline and 2646 in Embase, Medline identified 1662 publications not found by Embase, Embase identified 1422 publications not found by Medline. Compared with the short strategy, our search strategy yielded on average 52% more publications (94%, 41% and 20% more in Medline, Embase and Current Contents, respectively), The PPV of our strategy (percent of publications that were really on PET. FDG and the specified subject) was 70%, compared with 76% using the short strategy. Regardless of the strategy used, Embase yielded more publications and was also slightly more specific than Medline, With the recommended strategy, FDG-PET publications can be identified more efficiently. We have shown the importance of searching more than one database and emphasize the use of both MeSH terms and text words in a search strategy. Standardization of the spelling of FDG and indexing of articles on FDG would substantially simplify searching.

Keywords: Search Strategy, Electronic Database, Positron Emission Tomography, Fluorine-18 Fluorodeoxyglucose, Identifying Relevant, Medline, Trials, Strategies

# Title: European Journal of Nuclear Medicine and Molecular Imaging

Full Journal Title: [European Journal of Nuclear Medicine and Molecular Imaging](http://www.springerlink.com/(vdfysq55ylehuw45jdo23w45)/app/home/journal.asp?referrer=backto&backto=linkingpublicationresults,1:100414,1;&absoluteposition=2#A2); [European Journal of Nuclear Medicine and Molecular Imaging](http://www.springerlink.com.ludwig.lub.lu.se/content/100414/)

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Publisher Address:

Subject Categories:

: Impact Factor

Signore, A. and Annovazzi, A. (2004), Scientific production and impact of nuclear medicine in Europe: how do we publish? *European Journal of Nuclear Medicine and Molecular Imaging*, **31** (6), 882-886.

Full Text: [E\Eur J Nuc Med Mol Ima31, 882.pdf](E/Eur%20J%20Nuc%20Med%20Mol%20Ima31,%20882.pdf)

Abstract: We performed a bibliometric search covering a 1-year period to evaluate the number and the scientific ldquoweightrdquo of nuclear medicine papers published from European as compared with other countries. The scientific impact of our discipline was evaluated according to the *impact factor* of each publication, and we also aimed to identify those countries and topics that are making the principal contributions to the development of our discipline. To this end, a search on MEDLINE (PubMed) was run to find all peer-reviewed articles published between April 2002 and May 2003, using isotope definitions as search terms. A total of 3,292 publications were identified. Of these, 650 were of no nuclear medicine interest, 229 were reviews and 82 had no country specified. In absolute numbers, Europe leads research in nuclear medicine (939 papers, 38.9%) followed by the USA (608 papers, 25.2%). Among European countries, Germany is the nation that is currently making the greatest contribution to the scientific production of nuclear medicine in Europe. Articles concerning the use of nuclear medicine in oncology account for more than one-quarter of all published nuclear medicine papers.

Keywords: Nuclear Medicine, Literature Search, MEDLINE, Journals, Oncology

? Lass, P. (2005), The situation of nuclear medicine in Central and Eastern Europe. *European Journal of Nuclear Medicine and Molecular Imaging*, **32** (12), BP11-BP14.

Full Text: [2005\Eur J Nuc Med Mol Ima32, BP11.pdf](2005/Eur%20J%20Nuc%20Med%20Mol%20Ima32,%20BP11.pdf)

Abstract: This paper reviews the situation of nuclear medicine in Central and Eastern Europe (CEE), i.e. a group of 15 countries lying east of the Oder river-Trieste line and west of the present, planned EU eastern border. Together these countries have 106.6 million inhabitants, i.e. about a quarter of the population of the “European economic space”. Its nuclear medicine, however, represents less than 10% of European nuclear medicine manpower and equipment. In these countries there are at least 245 nuclear medicine departments with 661 nuclear medicine specialists and at least 376 gamma cameras. There are six dedicated PET units and three PET, SPECT centres, as well as one manufacturer of gamma cameras, six radiopharmaceutical manufacturers and two nuclear medicine scientific journals. The biggest nuclear medicine communities are in the Czech Republic, Hungary and Poland. The scientific input of the CEE countries to European science is moderate-about 10% when measured by EANM congress abstracts, and 5% when measured by the number of papers in MEDLINE-indexed journals. Mean European bibliometric parameters are approached only by Hungary and-to some extent-the Czech Republic. This survey indicates the need for international cooperation to improve the level of nuclear medicine in the CEE countries so that it reaches European standards. The potential of these countries could also be better used to the benefit of European nuclear medicine.

Keywords: Bibliometric, Central and Eastern Europe, Cooperation, Czech Republic, Eastern Europe, Economic, Equipment, EU, Europe, Gamma, Hungary, International, International Cooperation, Journals, Medicine, Nuclear Medicine, Papers, PET, Population, Potential, Reviews, Science, Scientific Journals, Standards, Survey

# Title: European Journal of Obstetrics & Gynecology and Reproductive Biology

Full Journal Title: [European Journal of Obstetrics & Gynecology and Reproductive Biology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5025&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=ce34a87044ebefccd80f488f53d98d6b)

ISO Abbreviated Title: Eur. J. Obstet. Gynecol. Reprod. Biol.

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Subject Categories:

Obstetrics & Gynecology: Impact Factor 0.854, 35/52 (2002)

Reproductive Biology: Impact Factor 0.854, / (2002)

Clark, T.J., Khan, K.S., Foon, R., Pattison, H., Bryan, S. and Gupta, J.K. (2002), Quality of life instruments in studies of menorrhagia: A systematic review. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, **104** (2), 96-104.

Full Text: [E\Eur J Obs Gyn Rep Bio104, 96.pdf](E/Eur%20J%20Obs%20Gyn%20Rep%20Bio104,%2096.pdf)

Abstract: *Background*: The use of quality of life (QoL) instruments in menorrhagia research is increasing but there is concern that not enough emphasis is placed on patient-focus in these measurements, i.e. on issues which are of importance to patients and reflect their experiences and concerns (clinical face validity). The objective was to assess the quality of QoL instruments in studies of menorrhagia. *Study design*: A systematic review of published research. Papers were identified through MEDLINE (1966–April 2000), EMBASE (1980–April 2000), Science Citation Index (1981–April 2000), Social Science Citation Index (1981–April 2000), CINAHL (1982–1999) and PsychLIT (1966–1999), and by manual searching of bibliographies of known primary and review articles. Studies were selected if they assessed women with menorrhagia for life quality, either developing QoL instruments or applying them as an outcome measure. Selected studies were assessed for quality of their QoL instruments, using a 17 items checklist including 10 items for clinical face validity (issues of relevance to patients’ expectations and concerns) and 7 items for measurement properties (such as reliability, responsiveness, etc.). *Results*: A total of 19 articles, 8 on instrument development and 11 on application, were included in the review. The generic Short Form 36 Health Survey Questionnaire (SF36) was used in 12/19 (63%) studies. Only two studies developed new specific QoL instruments for menorrhagia but they complied with 7/17 (41%) and 10/17 (59%) of the quality criteria. Quality assessment showed that only 7/19 (37%) studies complied with more than half the criteria for face validity whereas 17/19 (90%) studies complied with more than half of the criteria for measurement properties (*P* = 0.0001). *Conclusion*: Among existing QoL instruments, there is good compliance with the quality criteria for measurement properties but not with those for clinical face validity. There is a need to develop methodologically sound disease specific QoL instruments in menorrhagia focussing both on face validity and measurement properties.

Keywords: Menorrhagia, Quality of Life, Systematic Review

Honest, H., Bachmann, L.M. and Khan, K. (2003), Electronic searching of the literature for systematic reviews of screening and diagnostic tests for preterm birth. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, **107** (1), 19-23.

Full Text: [E\Eur J Obs Gyn Rep Bio107, 19.pdf](E/Eur%20J%20Obs%20Gyn%20Rep%20Bio107,%2019.pdf)

Abstract: *Background*: Published systematic reviews on prediction of preterm birth have tended to focus on a limited number of tests and their search strategies have often been relatively simple. Evaluation of all available tests in a systemic review will require a broad search strategy. *Aim*: To describe a case study of electronic searching for a systematic review of accuracy studies evaluating all tests for predicting preterm birth. *Methods*: The search strategy, developed to capture literatures concerning all the tests en-masse consisted of formulation of an appropriate combination of search terms, pilot searches to refine the search term combination, selection of relevant databases, and citation retrieval from the refined searches for selection of potentially relevant papers. Electronic searches were carried out on general bibliographic databases (Biosis, Embase, Medline, Pascal and Scisearch), specialised databases (Database of Abstracts of Reviews of Effectiveness, Medion, National Research Register, Cochrane Controlled Trial Register and Cochrane Database of Systematic Reviews). *Results*: A total of 30,076 citations were identified. Of these 8855 (29%) citations were duplications either within a database or across databases. Of the remaining 21,221 citations, 3333 were considered potentially relevant to the review after assessment by two reviewers. These citations covered 19 different tests for predicting preterm birth. *Conclusions*: This case study suggests that with use of a concerted effort to organise and manage the electronic searching it is feasible to undertake broad searches for systematic reviews with multiple questions.

Keywords: Diagnostic Tests, Preterm Birth, Electronic Searching

? García-García, P., López-Muñoz, F., Callejo, J., Martín-Águeda B. and Álamo, C. (2005), Evolution of Spanish scientific production in international obstetrics and gynecology journals during the period 1986–2002. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, **123** (2), 150-156.

Full Text: [2005\Eur J Obs Gyn Rep Bio123, 150.pdf](2005/Eur%20J%20Obs%20Gyn%20Rep%20Bio123,%20150.pdf)

Abstract: Objective: The present bibliometric study analyzes Spanish scientific work published in the field of obstetrics and gynecology in the most important journals during the period 1986–2002. Study design: The material studied (779 original documents) was selected in accordance with the science citation index (SCI) of 2001, obstetrics and gynecology section, using the EMBASE: Obstetrics and Gynecology database. We applied the customary rules of bibliometrics: Price’s Law of increase in scientific literature, Bradford’s Law of scattering of scientific literature and Lotka’s Law of author productivity. Furthermore, we analyzed participation index (PaI), the collaboration index and the superior (%SUP). Results: The material studied is closer to an exponential adjustment (r = 0.958) than to a linear adjustment (r = 0.856). The journal with the largest number of originals is Human Reproduction (Bradford’s first area), with 217 articles and that with the highest PaI is Menopause (4.07). The total number of authors is 1829, who are responsible for 3938 authorships (2.79% of the authors have a productivity index (PI) ≥ 1 and 70.09% have a PI = 0). The majority of the studies were carried out in hospitals (47.62%) and universities (23.36%). Conclusion: Spanish productivity in the field of obstetrics and gynecology increased considerably in the period 1986–2002.

Keywords: Bibliometric Indicators, Bibliometric Study, Bibliometrics, Bibliometry, Biomedicine, Care, Citation, Collaboration, Gynecology, Health-Sciences, Literature, Obstetrics, Publications, Science, Science Citation Index, Science-Citation-Index, Scientific Production, Spain, Spain

? Lenhard, M.S., Johnson, T.R.C., Himsl, I., Ditsch, N., Rueckert, S., Friese, K. and Untch, M. (2006), Obstetrical and gynecological writing and publishing in Europe. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, **129** (2), 119-123.

Full Text: [2006\Eur J Obs Gyn Rep Bio129, 119.pdf](2006/Eur%20J%20Obs%20Gyn%20Rep%20Bio129,%20119.pdf)

Abstract: Objective: To assess the number and quality of scientific articles published by authors from the European Union (EU) and Germany in the field of obstetrics and gynecology. Study design: Scientific articles published during the years 1980-2003 covered by the Journal Citation Report (JCR) were considered, with a focus on the impact factor (IF), authors’ origin, journal country and publishing language. Results: In 2003. there are 53 journals listed by the JCR for the field category ‘obstetrics and gynecology’, with altogether 3201 publications listed in the Science Citation Index (SCI). From the year 1980, the total number of publications increased persistently. Looking at the top 20 journals in the field of obstetrics and gynecology, there are 12 journals from the US, 8 from Europe. None of these journals has an IF > 10 but 30 journals show an IF > 1. Over the last 25 years, a growing importance of the English language as scientific language can be observed. Conclusion: These data indicate an important role of European research in the field of obstetrics and gynecology comparable to that of US-American research. The English language is gaining importance as scientific language, displacing other languages and contributing to a loss of impact of non-English journals. (C) 2006 Elsevier Ireland Ltd. All rights reserved.

Keywords: Country, Data, Design, EU, Europe, European Union, Field, Germany, Gynecology, Impact, Impact Factor, Ireland, Journal, Journals, Languages, Obstetrics, Origin, Publications, Publishing, Quality, Quality of, Research, Rights, Role, SCI, Science Citation Index, US

? Smith, V., Devane, D., Begley, C.M., Clarke, M. and Higgins, S. (2009), A systematic review and quality assessment of systematic reviews of randomised trials of interventions for preventing and treating preterm birth. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, **142** (1), 3-11.

Full Text: [2009\Eur J Obs Gyn Rep Bio, 142, 3.pdf](2009/Eur%20J%20Obs%20Gyn%20Rep%20Bio,%20142,%203.pdf)

Abstract: The aim of this paper is to identify reviews of interventions for preventing and treating preterm birth so that these could be appraised and the findings from good quality reviews highlighted. Reviews, rather than individual studies, are the basis for this systematic review because of the proliferation of reviews and the benefits of a single. consistent appraisal and assessment of evidence from these reviews rather than further attempts to find and appraise the many individual studies in the literature. Our systematic review consists of a description of five interventions for preventing and treating preterm birth: antibiotics, cervical cerclage, bed rest, progesterone, and tocolytic therapy, for which at least one relevant review was found. The scope and quality of the identified reviews are described, and their conclusions and the strength of these conclusions discussed. Potentially eligible reviews were sought primarily through searches of the electronic databases MEDLINE (1966-2008), EMBASE (1980-2008), CINHAL (1982-2008), Science Citation Index (1970-2008) and The Cochrane Library (issue 1,2008). Thirty-seven reviews were identified of which 22 were included in this systematic review of reviews. This shows that antibiotics may significantly delay, but might not prevent, preterm birth for women with preterm prelabour rupture of membranes; there is insufficient evidence to show the absolute efficacy of cerclage and bed rest in preventing preterm birth; the use of progesterone appears promising; and the possible benefits of certain tocolytics, such as beta-mimetics, need to be reliably measured against the possible adverse effects when used in preventing preterm birth. (C) 2008 Elsevier Ireland Ltd. All rights reserved.

Keywords: Antibiotic Therapy, Antibiotics, Assessment, Bacterial Vaginosis, Bed Rest, Bed Rest, Cerclage, Cervical Cerclage, Cervical Incompetence, Citation, Medline, Metaanalysis, Preterm Birth, Progesterone, Progesterone, Quality, Risk, Science, Systematic Review, Tocolytics, Women

? Yi, Y.X., Zhang, W., Zhou, Q., Guo, W.R. and Su, Y. (2011), Laparoscopic-assisted vaginal hysterectomy vs abdominal hysterectomy for benign disease: A meta-analysis of randomized controlled trials. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, **159** (1), 1-18.

Full Text: [2011\Eur J Obs Gyn Rep Bio159, 1.pdf](2011/Eur%20J%20Obs%20Gyn%20Rep%20Bio159,%201.pdf)

Abstract: The objective of this meta-analysis was to assess whether laparoscopic-assisted vaginal hysterectomy achieves better clinical results compared with abdominal hysterectomy. Medline (PubMed), EMBASE, Web of Science, ProQuest, Cochrane Library and China Biological Medicine Database were searched to identify randomized controlled trials that compared laparoscopic-assisted vaginal hysterectomy with abdominal hysterectomy. Twenty-three trials were studied and the analysis was performed using Review Manager Version 5 and R Version 2.11.1. The results showed that laparoscopic-assisted vaginal hysterectomy was associated with a longer operation time, less blood loss, shorter hospital stay, smaller haemoglobin drop, less postoperative pain, quicker return to normal activities and fewer pen-operative complications. Quality of life is likely to be the key outcome to evaluate the approach for hysterectomy, but further research is needed. For suitable patients and surgeons, laparoscopic-assisted vaginal hysterectomy is a better choice than abdominal hysterectomy. (C) 2011 Elsevier Ireland Ltd. All rights reserved.

Keywords: Abdominal Hysterectomy, Activities, Analysis, Approach, Blood, China, Cochrane, Complications, Database, Disease, Embase, Evaluate, Haemoglobin, Hospital, Laparoscopic-Assisted Vaginal Hysterectomy, Lavh, Medline, Meta Analysis, Meta-Analysis, Multicenter, Normal, Outcome, Pain, Patients, Prisma Statement, Pubmed, Quality, Quality of Life, Randomized Controlled Trials, Regression, Research, Review, Science, Short-Term, Systematic Reviews, Tissue Trauma, Uterus, Web of Science

# Title: European Journal of Operational Research

Full Journal Title: [[European Journal of Operational Research](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5963&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=964b2bbe499777180b8d7fb1a9abf30e)](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5963&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=964b2bbe499777180b8d7fb1a9abf30e)

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Publisher Address: PO Box 211, 1000 Ae Amsterdam, Netherlands

Subject Categories:

Operations Research & Management Science: Impact Factor 0.490, / (2000)

West, B.J. and Salk, J. (1987), Complexity, organization and uncertainty. *European Journal of Operational Research*, **30** (2), 117-128.

Full Text: [E\Eur J Ope Res30, 117.pdf](E/Eur%20J%20Ope%20Res30,%20117.pdf)

Abstract: We discuss a strategy for understanding some of the observed relationships between complexity, organization, and uncertainty. The approach is phenomenological and emphasizes the basically discontinuous, irregular, and uncertain aspects of sociobiological systems. Much of the discussion is motivated by the observed inverse power-laws that arise in a great many data sets, e.g. Lotka’s law in sociology, Pareto’s law in economics, and Zipf’s law in linguistics, and concludes that even the simplest of sociobiological systems elude the deterministic description of the physical sciences. It is conjectured that the clustering property implicit in such power-law behaviour may capture a `deep’ property of sociobiological systems, including perhaps the observed intermittency in speciation.

Keywords: Nonlinear, Science, Social, Stochastic Processes, Cybernetics

Liberatore, M.J. (1997), Automation, AI and OR: in search of the synergy and publication priorities. *European Journal of Operational Research*, **99** (2), 248-255.

Full Text: [E\Eur J Ope Res99, 248.pdf](E/Eur%20J%20Ope%20Res99,%20248.pdf)

Abstract: Automation is having a profound effect on the way we do work. It is estimated that nearly $40 billion was invested in U.S. industrial automation in 1991, with heavy investment in the European Union and the Asia-Pacific region as well. Some argue that technologies such as microelectronics will lead to widespread structural unemployment and an even greater sector of permanently unemployed. It would seem that OR and AI should be intimately involved in the various decisions that occur over the life cycle of automation technologies. Both of these disciplines share a common heritage and together they could help to improve the benefits reaped from increased usage of automation. In fact both are involved in the automation of decision making to varying degrees. This paper investigates the synergy between automation, AI, and OR using a bibliometric analysis of ABI INFORM citations. Simulation and expert systems were the two methodologies most often found in synergy articles. The results also show that the synergy between these fields has received limited coverage in professional and academic journals.

Keywords: Professional, Practice of OR, Automation, Artificial Intelligence

Eom, S.B. (1998), Relationships between the decision support system subspecialties and reference disciplines: An empirical investigation. *European Journal of Operational Research*, **104** (1), 31-45.

Full Text: [E\Eur J Ope Res104, 31.pdf](E/Eur%20J%20Ope%20Res104,%2031.pdf)

Abstract: This is a comprehensive study, that, by means of an empirical assessment of the DSS literature, systematically identifies the DSS reference disciplines and traces how concepts and findings by researchers in the contributing disciplines have been picked up by DSS researchers to be applied, extended, and refined in the development of DSS research subspecialties. Cluster analysis was employed to an author cocitation frequency matrix derived from a comprehensive database of the DSS literature over the period of 1970 through 1993. Twelve clusters were uncovered consisting of six major areas of DSS research (group DSS, foundations, model management, user interfaces, implementation, and multiple criteria DSS) and six contributing disciplines (multiple criteria decision making, cognitive science, organization science, artificial intelligence, group decision making, and systems science).

Keywords: Decision Support Systems, Intellectual Structure, Reference Disciplines, Bibliometrics, Cluster Analysis, Cocitation Analysis, Decision Support Systems, Operations Research, User Interfaces, Decision Making, Artificial Intelligence, Systems Science, Cluster Analysis, Cocitation Frequency Matrix, Bibliometrics, Multiple Criteria Decision Making, Cognitive Science, Organization Science

Korhonen, P., Tainio, R. and Wallenius, J. (2001), Value efficiency analysis of academic research. *European Journal of Operational Research*, **130** (1), 121-132.

Full Text: [E\Eur J Ope Res130, 121.pdf](E/Eur%20J%20Ope%20Res130,%20121.pdf)

Abstract: We propose a systematic approach to analyzing academic research performance at universities and research institutes. The analysis is based on identifying a set of decision-relevant (abstract) criteria. The scales for these criteria are defined by means of concrete indicators, all which are, however, not necessarily quantitative. Qualitative information is quantified using appropriate analytical tools. Once the criteria and indicators have been agreed upon and quantified, data on the research units is collected and a value efficiency analysis is performed. The efficiency of research units is defined in the spirit of data envelopment analysis (DEA), complemented with decision maker’s (DM’s) (rector in the European university system) preference information. This information is obtained by asking the DM to locate a point on the efficient frontier having the most preferred combination of input and output values. Our approach and the accompanying decision support system enables a university to allocate resources more efficiently than previously to its research units. Using data from the Helsinki school of economics, we illustrate how the approach works. (C) 2001 Elsevier Science B.V. All rights reserved.

Keywords: Multicriteria Analysis, Data Envelopment Analysis, Academic Research, Education, Performance Measurement, Data Envelopment Analysis, Weights Restrictions, Decision-Making, DEA

? Franceschini, F. and Maisano, D.A. (2010), Analysis of the Hirsch index’s operational properties. *European Journal of Operational Research*, **203** (2), 494-504.

Full Text: [2010\Eur J Ope Res203, 494.pdf](2010/Eur%20J%20Ope%20Res203,%20494.pdf)

Abstract: The h-index is a relatively recent bibliometric indicator for assessing the research output of scientists, based on the publications and the corresponding citations. Due to the original characteristics of easy calculation and immediate intuitive meaning, this indicator has become very popular in the scientific community. Also, it received some criticism essentially because of its “low” accuracy. The contribution of this paper is to provide a detailed analysis of the h-index, from the point of view of the indicator operational properties. This work can be helpful to better understand the peculiarities and limits of h and avoid its misuse. Finally, we suggest an additional indicator (f) that complements h with the information related to the publication age, not compromising the original simplicity and immediacy of understanding.

Keywords: Hirsch Index, Performance Evaluation, Citations, Ranking, Indicator Properties, Operational Properties, Publication Year

? Mingers, J. and Xu, F. (2010), The drivers of citations in management science journals. *European Journal of Operational Research*, **205** (2), 422-430.

Full Text: [2010\Eur J Ope Res205, 422.pdf](2010/Eur%20J%20Ope%20Res205,%20422.pdf)

Abstract: The number of citations is becoming an increasingly popular index for measuring the impact of a scholar’s research or the quality of an academic department. One obvious question is: what are the factors that influence the number of citations that a paper receives? This study investigates the number of citations received by papers published in six well-known management science journals. It considers factors that relate to the author(s), the article itself, and the journal. The results show that the strongest factor is the journal itself; but other factors are also significant including the length of the paper, the number of references, the status of the first author’s institution, and the type of paper, especially if it is a review. Overall, this study provides some insights into the determinants of a paper’s impact that may be helpful for particular stakeholders to make important decisions.

Keywords: Citations, Impact Factors, Journals, Research Quality

# Title: European Journal of Oral Sciences

Full Journal Title: [European Journal of Oral Sciences](http://www.blackwell-synergy.com/loi/eos); [European Journal of Oral Sciences](http://www3.interscience.wiley.com.ludwig.lub.lu.se/journal/118505323/home); [European Journal of Oral Sciences](http://web.ebscohost.com.ludwig.lub.lu.se/ehost/detail?vid=1&hid=111&sid=ef551dc7-33d5-4d55-946d-0a3dd7dd5a41%40sessionmgr113&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&jid=8DX)

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Subject Categories:

: Impact Factor

? Steerenberg, P.A., van Asperen, I.A., van Nieuw Amerongen, A., Biewenga, A., Mol, D. and Medema, G.J. (1997), Salivary levels of immunoglobulin A in triathletes. *European Journal of Oral Sciences*, **105** (4), 305-309.

Full Text: [1997\Eur J Ora Sci105, 305.pdf](1997/Eur%20J%20Ora%20Sci105,%20305.pdf)

Abstract: We investigated whether the physical exercise of an olympic distance triathlon affected the salivary IgA excretion of triathletes, as a biomarker for mucosal immune defence. 42 triathletes participated in the study. It was found that the salivary flow rate was decreased significantly after the race, thereby resulting in a significant reduction of the total salivary IgA output. The salivary IgA concentration (mg IgA/ml) did not differ, but expressed as total salivary protein, a significant reduction was observed. This was on the account of the salivary protein concentration (mg protein/ml), which was significantly increased. In contrast to the IgA secretion, the salivary amylase activity was increased significantly after the race. Therefore, our data suggest that the exercise of a triathlon may decrease the level of IgA-mediated immune protection at the mucosal surface. As triathletes may during the race be exposed to micro-organisms present in the swimming water, a decreased IgA-mediated immunity during the race may pose triathletes at an increased risk of infections.

? Gil-Montoya, J.A., Navarrete-Cortes, J., Pulgar, R., Santa, S. and Moya-Anegon, F. (2006), World dental research production: An ISI database approach (1999-2003). *European Journal of Oral Sciences*, **114** (2), 102-108.

Full Text: [2006\Eur J Ora Sci114, 102.pdf](2006/Eur%20J%20Ora%20Sci114,%20102.pdf)

Abstract: The objective of this study was to obtain a geographic world map of scientific production in dentistry by analysing published papers. Articles and reviews in the Dentistry, Oral Surgery & Medicine category published from 1999 to 2003 were accessed through the ISI database. The data were analyzed quantitatively (number of documents, number of researchers, productivity, interannual variation rate and relative specialization index), qualitatively (weighted impact factor, relative impact factor, citation rate per document and top 5 publications) and socioeconomically (number of documents per inhabitant and per dentist and in relation to the country’s GDP). The USA, UK, Japan and Scandinavian countries were found to be the most productive countries (number of publications). Publications from Scandinavian countries were also of high quality as measured by Impact Factor and Citation Rate, while the UK had one of the highest productivity rates (number of documents per researcher).

Keywords: Bibliometric, Biomedical Research, Dentistry, GDP, Impact, Impact Factor, Impact Factors, Index, ISI, Japan, Production, Productivity, Publications, Quality, Research, Reviews, Scientific Production, UK, USA

? Lopez, R., Scheutz, F., Errboe, M. and Baelum, V. (2007), Selection bias in case-control studies on periodontitis: A systematic review. *European Journal of Oral Sciences*, **115** (5), 339-343.

Full Text: [2007\Eur J Ora Sci115, 339.pdf](2007/Eur%20J%20Ora%20Sci115,%20339.pdf)

Abstract: In case-control studies the frequency of the exposure of interest is compared between a group of diseased subjects and a group of controls to determine whether an association exists between disease and exposure. Case-control studies are useful, but can be subject to several sources of bias if poorly conducted. Selection bias, which results in a lack of comparability between the groups being studied, is one of the most harmful types of bias. The aim of this study was to assess the information reported on case-control studies of periodontitis to identify sources of selection bias. We conducted an electronic search in PUBMED, EMBASE, and Web of Science and evaluated the occurrence of sources of selection bias in case-control studies published in English during the year 2004. In relatively few studies did the authors provided information on recruitment periods for cases and controls (31.1% and 20%, respectively), sampling methods (26.7% and 31.1%, respectively), or participation rates (8.9% and 6.7%, respectively). The source of control subjects was appropriate in 15.6% of the studies, and the strategy used to select the controls was adequate in only 8.9% of the studies. It may be concluded that case-control studies on periodontitis are frequently inadequately conducted and reported.

Keywords: Authors, Bias, Case-Control Studies, Control, Disease, Embase, Frequency, Information, Interest, Periodontal Disease, Periodontitis, Pubmed, Recruitment, Review, Science, Selection Bias, Strategy, Systematic, Systematic Review, Web of Science

? Lucena, C., Lopez, J.M., Abalos, C., Robles, V. and Pulgar, R. (2011), Statistical errors in microleakage studies in operative dentistry. A survey of the literature 2001-2009. *European Journal of Oral Sciences*, **119** (6), 504-510.

Full Text: [2011\Eur J Ora Sci119, 504.pdf](2011/Eur%20J%20Ora%20Sci119,%20504.pdf)

Abstract: The aim of this study was to assess the literature on microleakage of direct restorations in operative dentistry indexed in the ISI Web of Science, in order to assess the robustness of the statistical methodology used. Our database included 226 scientific papers (published between 2001 and 2009 in 22 journals) from the journal citation report categories ‘ Dentistry, Oral Surgery and Medicine ‘ and ‘ Materials Science, Biomaterials ‘. We reviewed all articles to find potential mistakes that are commonly made at different stages in the scientific research process. Microleakage was assessed quantitatively in 50 (22.2%) studies and qualitatively in 176 (77.8%) studies. In all studies reviewed the statistical methods used were appropriate for the category attributed to the outcome variable, but in 13% of the total, the chi- square test or parametric methods were inappropriately used afterwards. When the appropriate statistical methods were applied in studies that had originally employed inappropriate methods to analyse their data, and in which the authors provided raw data, an alteration of the conclusions was necessary in 15.4% of these re- analysed studies. This survey also showed that the statistical methodology applied varies considerably for similar experimental designs. This could have an effect on statistical results; hence, a more standardized methodology should be implemented.

Keywords: 3 Medical Journals, Articles, Authors, Citation, Common Pitfalls, Composite Restorations, Confidence Intervals, Dental Leakage, Dental Restorative Materials, Dentistry, Experimental, ISI, ISI Web of Science, Journal, Journals, Literature, Methodology, Non-Parametric Statistics, Outcome, Papers, Process, Recommendations, Regression, Research, Robustness, Science, Scientific Research, Shrinkage, Statistical, Statistical Bias, Statistical Methods, Surgery, Survey, Thermal-Stress, Variables, Web of Science

# Title: European Journal of Orthodontics

Full Journal Title: European Journal of Orthodontics

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Hunt, O., Burden, D., Hepper, P. and Johnston, C. (2005), The psychosocial effects of cleft lip and palate: A systematic review. *European Journal of Orthodontics*, **27** (3), 274-285.

Abstract: This systematic review examined the published scientific research on the psychosocial impact of cleft lip and palate (CLP) among children and adults. The primary objective of the review was to determine whether having CLIP places an individual at greater risk of psychosocial problems. Studies that examined the psychosocial functioning of children and adults with repaired non-syndromal CLP were suitable for inclusion. The following sources were searched: MEDLINE (January 1966-December 2003), CINAHL (January 1982-December 2003), Web of Science (January 1981-December 2003), PsycINFO (January 1887-December 2003), the reference section of relevant articles, and hand searches of relevant journals. There were 652 abstracts initially identified through database and other searches. On closer examination of these, only 117 appeared to meet the inclusion criteria. The full text of these papers was examined, with only 64 articles finally identified as suitable for inclusion in the review. Thirty of the 64 studies included a control group. The studies were longitudinal, cross-sectional, or retrospective in nature. Overall, the majority of children and adults with CLP do not appear to experience major psychosocial problems, although some specific problems may arise. For example, difficulties have been reported in relation to behavioural problems, satisfaction with facial appearance, depression, and anxiety. A few differences between cleft types have been found in relation to self-concept, satisfaction with facial appearance, depression, attachment, learning problems, and interpersonal relationships. With a few exceptions, the age of the individual with CLP does not appear to influence the occurrence or severity of psychosocial problems. However, the studies lack the uniformity and consistency required to adequately summarize the psychosocial problems resulting from CLP.

Keywords: Adults, Anxiety, Children, Cleft Lip, Control, Craniofacial Care, Depression, Impact, Journals, Learning, Norwegian Adults, Oral-Facial Clefts, Orofacial Clefts, Papers, Personality Adjustment, Primary, Psychosocial, Questionnaire Survey, Research, Review, Risk, School-Age-Children, Science, Scientific Research, Self-Concept, Sociological Aspects, Systematic, Systematic Review, Undergone Standardized Treatment, Web of Science

# Title: European Journal of Orthopaedic Surgery and Traumatology

Full Journal Title: [European Journal of Orthopaedic Surgery and Traumatology](http://www.springerlink.com/content/101157/?p=59974eed77ef4b94a5c9cde383964d19&pi=0)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Vitzthum, K., Spallek, M., Mache, S., Quarcoo, D., Scutaru, C., Groneberg, D.A. and Schoffel, N. (2010), Cruciate ligament: Density-equalizing mapping and scientometrics as a measure of the current scientific evaluation. *European Journal of Orthopaedic Surgery and Traumatology*, **20** (3), 217-224.

Full Text: [2010\Eur J Ort Sur Tra20, 217.pdf](2010/Eur%20J%20Ort%20Sur%20Tra20,%20217.pdf)

Abstract: The topic “cruciate ligament’’ is of increasing interest due to improved diagnostic methods and the necessity to cure “modern’’ leisure time sports injuries. Publications have increased strongly since the 1990s. In this respect, it is difficult for a scientist to obtain an overview of a topic he, she is interested in. Scientometrics is a relatively new method to evaluate research efforts, to detect single areas of interest and to quantify the scientific impact of publications according to a particular topic. By comparing quantitative (i.e. number of published items) and qualitative factors (i.e. h-index, Impact-Factor or Citation rate), it is possible to evaluate this analysis methodically. In the period 1903-2007, a number of 9,806 published items were included in the ISI-Web referring to “cruciate ligament’’. The publications were published by 59 countries demonstrating the USA, Germany and the UK as the most productive ones. The “American Journal of Sports Medicine’’ was determined to be the most prolific journal and “WOO, SLY’’ as the most prolific author dealing with “cruciate ligament’’. The USA, Sweden, Finland and Norway take a leading position in citation per item rankings. In this respect, further analysis of the citations revealed the tendency of a disproportional high self-citation rate for some countries (e. g. Sweden, Finland). Self-citations lead to high average citations rates and distort further qualitative parameters (i.e. Impact-Factor, h-index). In this respect, the value of these parameters should be considered from a critical point of view. Furthermore, it might be useful to establish parameters which limit co-authorship and exclude self-citations to obtain more sustainable results.

Keywords: Citation, Citation Rate, Citations, Co-Authorship, Cruciate Ligament, Evaluation, Germany, h Index, h-Index, Impact, Impact Factor, Impact-Factor, Injury, ISI Web, Journal, Lead, Mapping, Methods, Publications, Quantitative, Rankings, Research, Scientific Impact, Scientometrics, Self-Citation, Self-Citations, Sweden, Topic, UK, USA

? Heneberg, P. (2011), Supposed steep increase in publications on cruciate ligament and other topics. *European Journal of Orthopaedic Surgery and Traumatology*, **21** (6), 401-405.

Full Text: [2011\Eur J Ort Sur Tra21, 401.pdf](2011/Eur%20J%20Ort%20Sur%20Tra21,%20401.pdf)

Abstract: An increasing number of national and international funding and statistical agencies utilize Web of Science (WOS) as a source of data influencing their decisions and analyses of research outcome. However, currently existing data sources for scientometric research, including WOS, are far from being perfect. Most of the imperfections are caused by uneven coverage, errors or changes in indexing policies, or mistaken or ineffective retrieval strategies employed by the users. Thus, it is important to be aware of the critical elements of scientometric evaluation, as inappropriately designed search procedures may lead to confusing or false-positive results. This paper presents the analysis of a series of previously published papers, which were affected by errors of omission and commission due to changes in WOS abstracting policies. When comparing WOS Topic search with WOS Title search, substantial differences arose. Number of papers published every year on cruciate ligament was shown to remain unchanged since early 1980s, when employing WOS Title search. Similarly, trends in number of citations on this topics remain unchanged through the long period of time, reflecting only increasing amount of citable papers available. The findings differ from those reported previously based on WOS Topic search, as improvement in the search protocol fully explained and rejected the previously reported steep increase in publications on cruciate ligament, air pollution, and oral lesions since 1991. The different outcomes compared to the other search protocols were caused by variations in WOS abstracting policies, such as exclusion of the address field, keywords, and exclusion or changes of the country codes or names. Despite the percentage of WOS records lacking these fields is decreasing in time, inclusion of such records hinders the ability to use the respective fields in any long-term searches using the WOS database. The results suggest that WOS Topic search is not the appropriate tool to search for time-dependent changes in publication productivity.

Keywords: Abstracting, Bibliographic Databases, Bibliometrics, Citation Analysis, Citations, Evaluation, Indexing, Informetrics, Outcomes, Papers, Policies, Publication, Publication Productivity, Publications, Research, Research Evaluation, Science, Scientometrics, Statistical, Web of Science

# Title: European Journal of Pain

Full Journal Title: [European Journal of Pain](http://www.sciencedirect.com/science/journal/10903801)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Handwerker, H.O. (2010), Impact factor blues. *European Journal of Pain*, **14** (1), 3-4.

Full Text: [2010\Eur J Pai14, 3.pdf](2010/Eur%20J%20Pai14,%203.pdf)

? Ferreira, M.L., Machado, G., Latimer, J., Maher, C., Ferreira, P.H. and Smeets, R.J. (2010), Factors defining care-seeking in low back pain: A meta-analysis of population based surveys. *European Journal of Pain*, **14** (7), 747.e1-747.e7.

Full Text: [2010\Eur J Pai14, 747.e1.pdf](2010/Eur%20J%20Pai14,%20747.e1.pdf)

Abstract: Little is known about factors determining health care-seeking behavior in low back pain. While a number of studies have described general characteristics of health care utilization, only a few have aimed at appropriately assessing determinants of care-seeking in back pain, by comparing seekers and non-seekers. The objective of this systematic review was to identify determinants of health care-seeking in studies with well-defined groups of care-seekers and non-seekers with non-specific low back pain. A search was conducted in MEDLINE, AMED, Cinahl, Web of Science, PsycINFO, National Research Register, Cochrane Library and LILACS looking for population-based surveys of non-specific low back pain patients older than 18 years, published since 1966. To be included in the review, studies needed to report on characteristics of well-defined groups of care-seekers and non-seekers. Methodological quality was assessed using a criteria list based on sampling, response rate, data reproducibility, power calculation and external validity. Risk estimates were expressed as odd ratios (95% confidence intervals). When possible, meta-analyses were performed, using a random effects model. Eleven studies were included in the review. Pooled results show that women are slightly more likely to seek care for their back pain as are patients with a previous history of back pain. Pain intensity was only slightly associated with care-seeking, whereas patients with high levels of disability were nearly eight times more likely to seek care than patients with lower levels of disability. (C) 2009 European Federation of International Association for the Study of Pain Chapters. Published by Elsevier Ltd. All rights reserved.

Keywords: Cochrane, Confidence Intervals, Determinants, Exercise, General-Population, Health Care, Health Care-Seeking Behavior, Health Resources, History, Low Back Pain, Meta-Analysis, Model, Pain, People, Prevalence, Research, Review, Science, Spinal Manipulative Therapy, Systematic, Systematic Review, Utilization, Validity, Web of Science, Women

# Title: European Journal of Pediatric Surgery

Full Journal Title: [European Journal of Pediatric Surgery](http://www.thieme-connect.de/ejournals/toc/ejps/33750); [European Journal of Pediatric Surgery](http://web.ebscohost.com.ludwig.lub.lu.se/ehost/detail?vid=1&hid=111&sid=0024ca4a-a6c5-4e14-8db1-404683209786%40sessionmgr113&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&jid=G95)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Celayir, S., Sander, S., Ellicevik, M., Vural, A. and Celayir, A.C. (2008), The most commonly cited articles in Pediatric Surgical Journals. *European Journal of Pediatric Surgery*, **18** (3), 160-163.

Full Text: Eur J Ped Sur18, 160.pdf

Abstract: Aim: This study aimed to investigate the characteristics of the most frequently cited articles published in 3 main journals dedicated to the field of pediatric surgery (journal of Pediatric Surgery, Pediatric Surgery International and European journal of Pediatric Surgery). Material and Methods: A search was initiated using the database (1985 - 2006) of the Science Citation Index of the Institute for Scientific Information. The total number of publications and their citation numbers were found and the most cited articles were investigated in detail. A total of 600 (200 from each journal) most cited articles were identified and chosen for further analysis. Results: The total number of citations in these 3 journals was 20271. The citations of the most cited articles ranged from 10 to 224. The articles were published between 1985 and 2003 and the mean number of citations/article was 33.78. Articles originated from 39 counties and 256 institutions. The leading countries were the United States (203 articles from 75 institutions), Germany (50 articles from 21 institutions), Japan (34 articles from 17 institutions), Switzerland (34 articles from 8 institutions), United Kingdom (32 articles from 19 institutions), and Canada (28 articles from 7 institutions). Of the institutions with the highest number of cited articles, four institutions were from the USA followed by Switzerland with two institutions. The leading topics were the gastrointestinal system (n=239), respiratory system (n=94), urology (n=61) and oncology (n=56), and diaphragmatic hernia (n=41) was the most common special topic. There were 42 case reports (7%) and 75 experimental research articles (12.5%). Thirty-four authors from 14 countries and 30 institutions had articles in more than one journal. The most cited author was N. S. Adzick from the USA with 224 citations. Conclusion: In this study, we found that the journal of Pediatric Surgery predominated with the greatest number of cited articles. The most cited articles, authors and institutions originated from the USA and English-speaking countries. The gastrointestinal system, respiratory system, urology and oncology were the leading topics and diaphragmatic hernia was the most common special topic.

Keywords: 100 Citation-Classics, Analysis, Association, Bias, Citation, Citations, Impact Factor, Journal, Pediatric Surgery

? Liang, Z., Guo, J., Zhang, H., Yang, C., Pu, J., Mei, H., Zheng, L. and Tong, Q. (2011), Lymphatic sparing versus lymphatic non-sparing laparoscopic varicocelectomy in children and adolescents: A systematic review and meta-analysis. *European Journal of Pediatric Surgery*, **21** (3), 147-153.

Full Text: 2011\Eur J Ped Sur21, 147.pdf

Abstract: Objective: The aim of this study was to explore the true efficacy and potential advantages of lymphatic sparing laparoscopic varicocelectomy (LSV) over lymphatic non-sparing laparoscopic varicocelectomy (LNSV) in children and adolescents. Methods: A search was made for studies published up until 31 August 2010 using the terms “lymphatic sparing varicocelectomy”, “laparoscopy”, “adolescent” and “children” in the MEDLINE, EMBASE, Ovid, Web of Science, and Cochrane databases. Randomized controlled trials (RCTs) and observational clinical studies (OCSs) comparing LSV and LNSV were included. A systematic review and meta-analysis was performed using odds ratios (ORs) for dichotomous variables. Results: Out of 127 studies, 2 RCTs and 4 OCSs were eligible for inclusion, comprising 489 cases of LSV and 307 cases of LNSV. The hydrocele rates after LSV were significantly lower than after LNSV (OR = 0.19; 95 % confidence interval [CI] = 0.10 to 0.36; p < 0.00001). However, no signifi cant difference was observed between LSV and LNSV with regard to recurrence (OR = 0.65; 95 % CI = 0.32 - 1.33; p = 0.24) or catch-up growth (OR = 2.14; 95 % CI = 0.97-4.72; p = 0.06). Conclusion: LSV is valuable in reducing the incidence of postoperative hydrocele, with similar recurrence and catch-up growth rates as LNSV. A series of RCTs are warranted to explore the efficacy of LSV in the management of varicocele in children and adolescents.

Keywords: Adolescent, Adolescents, Children, Cochrane, Databases, Dye, Efficacy, Hydrocele, Isosulphan Blue, Laparoscopy, Ligation, Lymphatic Sparing Varicocelectomy, Management, Meta-Analysis, Methods, Microsurgical Repair, Outcomes, Randomized Controlled Trials, Recurrence, Review, Science, Systematic, Systematic Review, Trial, Vessels, Web of Science

# Title: European Journal of Pediatrics

Full Journal Title: [European Journal of Pediatrics](http://www.springerlink.com.ludwig.lub.lu.se/content/100415/); [European Journal of Pediatrics](http://web.ebscohost.com.ludwig.lub.lu.se/ehost/detail?vid=1&hid=111&sid=0fa8eaae-e81c-4628-98a1-cefe03e53c18%40sessionmgr114&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&jid=CR1)

ISO Abbreviated Title: Eur. J. Pediatr.

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ISSN: 0340-6199

Issues/Year: 12

Journal Country/Territory: Germany

Language: English

Publisher: Springer Verlag

Publisher Address: 175 Fifth Ave, New York, NY 10010

Subject Categories:

Pediatrics: Impact Factor 1.220, 25/69 (2001)

? Mundlos, A. (1993), More on lead toxicity. *European Journal of Pediatrics*, **152** (4), 375-376.

Full Text: [1993\Eur J Ped152, 375.pdf](1993/Eur%20J%20Ped152,%20375.pdf)

# Title: European Journal of Pharmaceutics and Biopharmaceutics

Full Journal Title: [European Journal of Pharmaceutics and Biopharmaceutics](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5027&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=dc8a5f7aeaff480e93adb6b52e4ec1f6)

ISO Abbreviated Title: Eur. J. Pharm. Biopharm.

JCR Abbreviated Title: Eur J Pharm Biopharm

ISSN: 0939-6411

Issues/Year: 6

Journal Country/Territory: Netherlands

Language: Multi-Language

Publisher: Elsevier Science BV

Publisher Address: PO Box 211, 1000 AE Amsterdam, Netherlands

Subject Categories:

Pharmacology & Pharmacy: Impact Factor

? Friess, W. (1998), Collagen - biomaterial for drug delivery. *European Journal of Pharmaceutics and Biopharmaceutics*, **45** (2), 113-136.

Full Text: [1998\Eur J Pha Bio48, 113.pdf](1998/Eur%20J%20Pha%20Bio48,%20113.pdf)

Abstract: The use of collagen as a biomaterial is currently undergoing a renaissance in the tissue engineering field. The biotechnological applications focus on the aspects of cellular growth or delivery of proteins capable of stimulating cellular response. However, basic knowledge about collagen biochemistry and the processing technology in combination with understanding of the physico-chemical properties is necessary for an adequate application of collagen for carrier systems. The purpose of this review article is to summarize information available on collagen dosage forms for drug delivery as well as to impart an overview of the chemical structures and the galenical properties including detailed description of the processing steps - extraction, purification, chemical crosslinking and sterilization. The most successful and stimulating applications are shields in ophthalmology, injectable dispersions for local tumor treatment, sponges carrying antibiotics and minipellets loaded with protein drugs. However, the scientific information about manipulating release properties or mechanistic studies is not as abundant as for some synthetic polymers. (C) 1998 Elsevier Science B.V.

Keywords: Biomaterials; Collagen; Crosslinking; Devices; Growth Factors; Injectables; Ophthalmology; Sponges, Dermal Sheep Collagen; Cross-Linked Collagen; Fibroblast Growth-Factor; In-Vitro Degradation; Bone Morphogenetic Protein-2; Chemically Modified Collagen; Artificial Skin; Mechanical-Properties; Extracellular-Matrix; Injectable Collagen

Lake, O.A., Olling, M. and Barends, D.M. (1999), In vitro/in vivo correlations of dissolution data of carbamazepine immediate release tablets with pharmacokinetic data obtained in healthy volunteers. *European Journal of Pharmaceutics and Biopharmaceutics*, **48** (1), 13-19.

Full Text: [E\Eur J Pha Bio48, 13.pdf](E/Eur%20J%20Pha%20Bio48,%2013.pdf)

Abstract: The aim of the study was to select a dissolution test method for carbamazepine (CBZ) immediate release tablets, giving the best in vitro/in vivo correlations (IVIVC) and to determine the potential of this method as an estimate for bioequivalence testing. Four 200 mg CBZ products which are sold on the Dutch market, covering the innovator and three generic products, were selected. They had been tested in a randomised, fourway cross-over bioavailability study in healthy volunteers. Their dissolution rate behaviour in vitro was investigated in two dissolution media: (1) 1% sodium lauryl sulphate in water (SLS), in accordance with the United States Pharmacopeia (USP), (2) 0.1 mol/l Hydrochloric acid in water (HC). In the bioavailability study these products had shown no large differences in the extent of absorption (AUC (0-infinity),) but large differences in absorption rate. The products now also showed large differences in dissolution rate in vitro in both dissolution media, the rank order being the same as for the absorption rate. It was concluded that the absorption rate in vivo depends on the dissolution rate in vivo. ‘Level C’ IVIVC according to the USP were optimised by plotting percentages dissolved on selected time points (D values) or their reciprocals (1/D values), against several pharmacokinetic parameters primarily related to the absorption phase and against AUC (0-infinity). In this way for each IVIVC the optimum D or 1/D value, was calculated. For both media no meaningful IVIVC were obtained with AUC (0-infinity), but favourable IVIVC were obtained with the parameters primarily related to the absorption phase. In the bioavailability study indicated above it was found that, among the pharmacokinetic characteristics primarily related to the absorption phase, C (max) is the most promising in expressing rate of absorption in bioequivalence testing in single dose studies with CBZ immediate release tablets. Consequently, C (max) was selected for expressing rate of absorption. The most favourable IVIVC were obtained with D (20) in SLS versus C (max). From this IVIVC and the requirements for bioequivalence (AUC (0-infinity): 0.8-1.25 and C (max): 0.75-1.35, 90% confidence interval), a specification for dissolution testing in SLS was calculated as follows: ‘after 20 minutes, 34-99% dissolved’. Owing to the fact that the rate of absorption in vivo depends on i.a. the dissolution rate in vivo, it can be concluded that with this specification bioequivalence with respect to both rate of absorption and extent of absorption is ensured. As this specification is comparable with the USP specification: ‘not less than 75% dissolved after 1 h’, it is concluded that the USP specification is suitable to ensure bioequivalence of CBZ immediate release tablets.

? Saha, P. and Kou, J.H. (2002), Effect of bovine serum albumin on drug permeability estimation across Caco-2 monolayers. *European Journal of Pharmaceutics and Biopharmaceutics*, **54** (3), 319-324.

Full Text: [2002\Eur J Pha Bio54, 319.pdf](2002/Eur%20J%20Pha%20Bio54,%20319.pdf)

Abstract: The purpose of this study was to explore approaches to more accurately assess Caco-2 permeability of poorly water-soluble new chemical entities (NCEs) in an effort to determine their biopharmaceutics classification system (BCS) permeability class with a higher level of confidence. The transport of reference compounds and NCEs (Sch-Y, Sch 56592) was studied across Caco-2 monolayers in the absence or presence of varying percentage of bovine serum albumin (BSA) in the receiver chamber. The inclusion of 0.5-4% BSA in the receiver chamber caused a 4-5-fold increase in Sch-Y P-app, while Sch 56592 P-app was not significantly influenced. Amongst reference solutes, the P-app ratio (+BSA/ctrl) was significant (1.3-fold) only for diltiazem (log PC = 2.7, plasma protein binding = 78%), but the prediction of human oral absorption for such,drugs was not affected by the presence of BSA in receiver. In summary, the use of 4% BSA in the receiver chamber during transport studies can dramatically affect the estimated Caco-2 P-app and BCS permeability ranking of highly lipophilic NCEs, as in the case of Sch-Y with a log PC of 4.0. For Sch-Y, this is presumably due to improved sink conditions and/or a reduction in non-specific drug adsorption to plastic wells. In contrast, the permeability classification of Sch 56592 (log PC = 2.4) based on estimated Caco-2 P-app values is not affected by the presence of receiver BSA. (C) 2002 Elsevier Science B.V. All rights reserved.

Keywords: Absorption, Adsorption, Bovine Serum Albumin, Bsa, Caco-2, Cell Monolayers, Colon, Drug, Human, Line, Model, Oral, Oral Absorption, Permeability, Permeability Estimation, Plasma, Ranking, Ratio, Reduction, Science, Transport

# Title: European Journal of Physical and Rehabilitation Medicine

Full Journal Title: European Journal of Physical and Rehabilitation Medicine

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Franchignoni, F., Lasa, S.M., Ozcakar, L. and Ottonello, M. (2011), Bibliometric indicators: A snapshot of the scientific productivity of leading European PRM researchers. *European Journal of Physical and Rehabilitation Medicine*, **47** (3), 455-462.

Full Text: [2011\Eur J Phy Reh Med47, 455.pdf](2011/Eur%20J%20Phy%20Reh%20Med47,%20455.pdf)

Abstract: Aim. The aim of this paper was to explore the validity and practical usefulness of a set of bibliometric indicators with a focus on the scientific production of influential European researchers in Physical and Rehabilitation Medicine (PRM). Methods. We randomly selected 24 European PRM specialists from the list of invited lecturers or chairpersons at the 17(th) ESPRM Congress in 2010. Using the time window 1996-2010, we recorded the number of papers published, total number of citations, and h-index from Web of Science (WoS) and Publish or Perish (PoP) databases. We also noted the journals in which the papers were published. Ranking the 24 authors into two groups according to higher vs. lower research productivity, we compared the frequency of Editorial Board membership of at least one of the 5 most influential journals in PRM. Results. Median values (WoS, PoP) for papers, citations, and h-index were respectively: (31, 46); (171, 317); and (6.5, 8.5). High correlations were found among different indicators, and also between the same indicators calculated in the two different databases. However, the Bland-Altman plot indicated that the two databases could not be considered interchangeable. Twelve PRM specialists were Editorial Board members: 11 of them were in the first 10 ranking positions for at least one of the 6 indicators analysed. Conclusion. There is need to better understand the characteristics of bibliometric indicators and we retain that the information they provide is insufficiently valid to justify their use as the sole objective criterion for career assessment.

Keywords: Assessment, Authors, Bibliometric, Bibliometric Indicators, Bibliometrics, Citations, Databases, Frequency, Google-Scholar, h Index, h-Index, Hirsch-Index, Impact, Information, Journals, Methods, Output, Papers, Physical and Rehabilitation Medicine, Productivity, Publications, Publish or Perish, Ranking, Rehabilitation, Rehabilitation-Medicine, Research, Research Performance, Research Productivity, Researchers, Science, Scientific Production, Scientific Productivity, Scopus, Validity, Web of Science, Web-of-Science, WOS

# Title: European Journal of Protistology

Full Journal Title: [European Journal of Protistology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=20447&_auth=y&_acct=C000051951&_version=1&_urlVersion=0&_userid=1196840&md5=439dfea140b4fce845e513d9e535acd1)

ISO Abbreviated Title: Eur. J. Protistol.

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ISSN: 0932-4739

Issues/Year: 4

Journal Country/Territory: Germany

Language: Multi-Language

Publisher: Urban & Fischer Verlag

Publisher Address: Branch Office Jena, PO Box 100537, D-07705 Jena, Germany

Subject Categories:

Biology, Miscellaneous: Impact Factor 0.813, / (2000), Impact Factor 0.919, 25/41 (2001)

Microbiology: Impact Factor 0.813, / (2000), Impact Factor 0.919, 60/81 (2001)

? Meht, S.K., Tripathi, B.N. and Gaur, J.P. (2000), Influence of pH, temperature, culture age and cations on adsorption and uptake of Ni by *Chlorella vulgaris*. *European Journal of Protistology*, **36** (4), 443-450.

Full Text: Eur J Pro36, 443.pdf

Abstract: Nickel accumulation by *C. Vulgaris* was studied distinguishing adsorption and intracellular accumulation. The surface adsorption contributed maximally (<80%) to total Ni accumulation by the test alga. It was maximal and of equal magnitude at pH 3.5 and 5.5 accordingly suggesting the participation of strong and weak acidic functional groups of *C. Vulgaris* with relatively low and high affinity for Ni adsorption. Nickel uptake was greatly reduced at acidic pH. The cultures in the decline phase of growth showed highest adsorption of Ni but the rate of Ni uptake was greatly reduced when cultures were in the decline or stationary phase of growth. A better exposure of Ni binding sites, or generation of new sites was perhaps responsible for greater Ni adsorption by old cultures of *C. Vulgaris*. Sodium and K caused mixed inhibition whereas Ca and Mg caused noncompetitive inhibition of adsorption and uptake of Ni. Chromium was not able to competitively inhibit adsorption and uptake of Ni by the test alga. The competitive inhibition of Ni adsorption by Cu and Zn seems to be related to their similar ionic properties. Cu stimulated Ni uptake due possibly to increased permeability of the plasma membrane. The present study disagrees with the general conception that cations are competitive inhibitors of metal adsorption and uptake by algae.

Keywords: Adsorption, Uptake, Heavy Metal, *Chlorella vulgaris*, Nickel, Moss Rhytidiadelphus-Squarrosus, Heavy-Metals, Biosorption, Cadmium, Copper, Zinc

? Meht, S.K. and Gaur, J.P. (2001), Removal of Ni and Cu from single and binary metal solutions by free and immobilized *Chlorella vulgaris*. *European Journal of Protistology*, **37** (3), 261-271.

Full Text: [2001\Eur J Pro37, 261.pdf](2001/Eur%20J%20Pro37,%20261.pdf)

Abstract: The potential of calcium alginate-entrapped *Chlorella vulgaris* in removing Ni and Cu from single and binary metal solution was determined. Almost complete removal of test metals from the solution by Chlorella beads (biomass concentration, 100 mg dry weight l-1) was achieved within 1 h when metal concentration was < 10 mg l-1. The metal sorption capacity of free and immobilized biomass from binary metal solution was also determined using 3-D plots. The presence of the secondary metal (Cu and Ni) inhibited the sorption of the primary metal (Ni and Cu) by free as well immobilized cells but inhibition in sorption of Ni due to Cu was stronger than inhibition of Cu sorption by Ni. The total metal (Ni + Cu) sorbed from the binary metal solution by free as well as immobilized cells always remained lower than the total sorption of individual metals from their respective single metal solutions, thereby suggesting competition between Ni and Cu for the common binding sites on Chlorella. Better fitness of equilibrium metal sorption data to the Freundlich than the Langmuir model suggests multilayer adsorption of test metals onto the cell surface. Higher Kf and qm (Freundlich and Langmuir constants, respectively) for Cu than Ni sorption suggested that the test alga has a greater affinity for Cu than for Ni. It may be possible to use Chlorella beads for complete removal of Ni and Cu from dilute solutions having their concentrations below 10 mg l-1.

Keywords: *Chlorella vulgaris*, Heavy Metals, Immobilization, Isotherm Model, Removal, Sorption, Heavy-Metals, *Saccharomyces-Cerevisiae*, Biosorption Equilibria, Biomass, Cells, Accumulation, Toxicity, Cadmium, Systems, Mercury

# Title: European Journal of Public Health

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Public, Environmental & Occupational Health: Impact Factor 1.481, 59/98 (2006)

La Torre, G., Bertazzoni, G., Zotta, D., Van Beeck, E. and Ricciardi, G. (2002), Epidemiology of accidents among users of two-wheeled motor vehicles: A surveillance study in two Italian cities. *European Journal of Public Health*, **12** (2), 99-103.

Full Text: [2002\Eur Pub Hea12, 99.pdf](2002/Eur%20Pub%20Hea12,%2099.pdf)

Abstract: Background: This paper describes a study on the epidemiology of accidents among users of two-wheeled motor vehicles in two Italian cities, Rome and Naples. Methods: A surveillance study was conducted, recruiting the victims of accidents among users of two-wheeled motor vehicles, visiting the emergency departments of two Italian hospitals. The registration form includes personal data of the involved person, circumstances of the accident, means of arrival at the hospital, type of vehicles involved, helmet use, and eventually third parties involved, and data on the specific injury diagnosis. Results: 736 injured drivers of two-wheeled motor vehicles were investigated for the study (65.1% males, 34.9% females). The mean age of the victims was 22.92 years, 42.9% of the injuries were the result of a single accident. In 35.5% of the injuries cars were involved and in 8.6% of the cases there was a passenger included. Only 12% of the injured people were wearing a helmet. Most of the lesions concerns the knee or lower leg (27.5%), followed by the head (17.5%), elbow and forearm (8.8%), wrist and hand (8.6%), shoulder and upper arm (8.4%) and ankle and foot (6.9%). Helmet use has a protective effect (OR = 0.23), whereas accidents in Naples and during dark hours are associated with an increased risk of head injury (respectively OR = 1.93, and OR = 1.46). Conclusion: In this study the lower injury risk due to the use of the helmet on the frequency and severity of head trauma was confirmed. Moreover, the results confirm that Emergency Departments can provide essential epidemiological information, and they have already provided clear arguments in favour of extending the compulsory use of helmets to people above 18 years in Italy.

Keywords: Accidents, Epidemiology, Italy, Two-Wheeled Motor Vehicle, Helmet Use Law, Medical Costs, Injury, Impact, Prevention, Crashes, Trauma, Riders, Usage

? Delnoij, D.M.J. and Groenewegen, P.P. (2007), Health services and systems research in Europe: Overview of the literature 1995-2005. *European Journal of Public Health*, **17** (1), 10-13.

Full Text: [2007\Eur Pub Hea17, 10.pdf](2007/Eur%20Pub%20Hea17,%2010.pdf)

Abstract: Introduction: Our objective, within the collaborative study SPHERE (Strengthening Public Health Research in Europe) is to give an overview of health services and health systems research in Europe, based on a search of the literature in PubMed and Embase. Method: The method used in this study consisted of: W A bibliometric analysis, and (II) Classification of health services and systems research according to pre-defined criteria for a sample of 500 publications in the PubMed search. Results: Health services research is particularly strong in the Nordic countries. The number of publications on health services research has increased steadily between 1996 and 2004, 60% of the references found had a keyword related to ‘patient’. More than one-third of the references had a keyword related to ‘hospital’. The keyword ‘general practitioner’ occurred in 16% of the cases. The emphasis on this keyword was higher in those countries where the GP traditionally holds a strong position, but also in the new member states, Estonia and Slovenia. Of a smaller sample classified in depth; 57% addressed problems of efficiency and quality improvement; 27% focused on the organization of health care, cohesion and arrangement of supply according to needs and demands; only 10% addressed problems of inequalities and distribution of services. Conclusions: Health services research is a growing domain of research. As an applied discipline, health services research can be expected to closely follow political agendas. The majority of studies focus on improving the efficiency and quality of the system. Only 10% of the studies address inequalities in health utilization.

Keywords: Bibliometric, Bibliometric Analysis, Bibliometry, Europe, Health Services Research, Hospital, Literature, Literature Review, Public Health Research, Publications, Pubmed, Quality

? Tarkowski, S.M. (2007), Environmental health research in Europe: Bibliometric analysis. *European Journal of Public Health*, **17** (1), 14-18.

Full Text: [2007\Eur Pub Hea17, 14.pdf](2007/Eur%20Pub%20Hea17,%2014.pdf)

Abstract: Background: This article describes a bibliometric review of the environmental health research literature in Europe for a period of 10 years. The work, within the study SPHERE (Strengthening Public Health Research in Europe) aimed to provide an overview of the extent of published environmental health research in Europe and to assess recent output in this research field and future research direction. Methods: Medline was used via the PubMed online service of the US National Library of Medicine. Only original, peer-reviewed research journal articles were retrieved, which were published from mid-1995 to mid-2005 and by authors from the 28 (then) countries in Europe of the European Economic Area plus Switzerland. Results: In the PubMed database, 6329 references were located and were allocated to 11 pre-defined topic areas and 31 subtopic areas. The largest number of articles was in the topic area of work environment and health (2339) followed by environmental exposures (1314) and environmental illnesses (952) and these were the primary foci of 73% of the published articles. There were marked differences between countries in the number of published articles. Ten countries contributed 81% of all publications. It is apparent that economic factors have a major role for research outputs of countries in environmental health. Conclusions: Major advances have been made during recent years in the understanding of associations between health and environment, and of biological, environmental and social mechanisms involved in this association. More emphasis should be placed on investigations of complex environmental health problems such as complex exposures to different pollutants at different levels and their combined health impact in different populations.

Keywords: Bibliometric, Bibliometric Analysis, Environment, Environmental Health, Environmental Health Research, Europe, European Economic Area, Journal Articles, Literature, Publications, PubMed, US

? Durando, P., Sticchi, L., Sasso, L. and Gasparini, R. (2007), Public health research literature on infectious diseases: Coverage and gaps in Europe. *European Journal of Public Health*, **17** (1), 19-23.

Full Text: [2007\Eur Pub Hea17, 19.pdf](2007/Eur%20Pub%20Hea17,%2019.pdf)

Abstract: Background: In this study, bibliometric methods were used to investigate prevention and control of infectious diseases (IDs). The aim was to gain an overall view of published research on IDs in Europe as part of the collaborative study SPHERE (Strengthening Public Health Research in Europe). Methods: A framework for research on lDs and public health was developed with definitions, keywords, inclusion and exclusion criteria. A detailed web search strategy based on the framework was designed, piloted and refined. The PubMed electronic database was searched for ‘infectious diseases’ as a whole, and for several subtopic areas, across July 1995 and June 2005. Numbers of publications by year, country, population and Gross Domestic Product were calculated. Results: Nearly 21000 publications on the main topic and sub-topics were found, with a progressive increase particularly since 2000. There was a marked heterogeneity between countries. France, Italy, The Netherlands, Spain, Germany, Switzerland, Sweden, UK and Belgium were the most prolific, and Eastern European countries less so. ‘Vaccine-preventable diseases’, ‘Sexually transmitted diseases’, ‘Drug-resistant infections’, ‘Insect-arthropod-related diseases’ and ‘Childhood diseases’ were the main fields of scientific production. Research on ‘Epidemiology and Surveillance’ appeared, in general, to be better represented than research on ‘Prevention and Control’. Discussion: This is the first time such a broad approach has been used to describe public health research on IDs across Europe. A priority should be cooperation between European states where there is little or no, scientific production. Bibliometrics has limitations, but is of value to indicate a general pattern.

Keywords: Bibliometric, Bibliometric Methods, Children, Europe, Inequalities, Infectious Diseases, Italy, Literature, Public Health, Public Health Research, Publications, Pubmed, Scientific Production, Scientific Research, Spain, Vaccine

? Clarke, A., Gatineau, M., Thorogood, M. and Wyn-Roberts, N. (2007), Health promotion research literature in Europe 1995-2005. *European Journal of Public Health*, **17** (1), 24-28.

Full Text: [2007\Eur Pub Hea17, 24.pdf](2007/Eur%20Pub%20Hea17,%2024.pdf)

Abstract: Background: To undertake an overview of health promotion research in the EEA to inform the collaborative study-SPHERE (Strengthening Public Health Research in Europe). Methods: A ‘filter’ (search strategy) was used to search Medline and Embase for a 10-year period from 1995 to 2005. A 32% (6000) sample of the filter output was assessed for proportion constituting health promotion. Output was analysed by country, population, gross domestic product (GDP) and health need (disability-adjusted life years, DALYs). Disease prevention (screening and immunization) and health improvement papers were separately identified. The latter were classified by methodology, level of intervention and topic area. Results: 18862 papers were identified. One-third was identified as health promotion (2206/6000, 36.7%) equivalent to 6935 (CI 6651-7230). Production varied: Nordic countries were highest producers per million population; the UK the largest net producer. There was a weak relationship between health promotion publication and population size (r(2)=0.38); a weak inverse relationship with relative health (DALYs per million population) (r(2)=0.07) and a slightly stronger relationship with GDP (r(2)=0.45). Twenty-eight percent (626/2206) of the papers identified were disease prevention (screening and immunization). The largest topic areas of the remainder (1580) were diet and exercise, smoking and tobacco, and cardiovascular disease reduction. Accidents and violence, alcohol and mental health each accounted for <5% of total output. Intervention studies were a minority; with less aimed at the regional/national or policy or legal and fiscal levels. Conclusion: Health promotion research production varies across Europe. Research commissioning should stress interventional and policy level research.

Keywords: Bibliometrics, Europe, Health Promotion, Literature, Literature Review, Mental Health, Public Health Research, Smoking

? Clarke, A., Gatineau, M., Grimaud, O., Royer-Devaux, S., Wyn-Roberts, N., Le Bis, I. and Lewison, G. (2007), A bibliometric overview of public health research in Europe. *European Journal of Public Health*, **17** (1), 43-49.

Full Text: [2007\Eur Pub Hea17, 43.pdf](2007/Eur%20Pub%20Hea17,%2043.pdf)

Abstract: Background: Our aim, within the collaborative study SPHERE (Strengthening Public Health Research in Europe), was to produce a bibliometric overview of public health research literature for Europe. Methods: A search strategy (‘filter’) was designed to interrogate the Science Citation Index (SCI) and the Social Science Citation Index (SSCI) databases for research articles published between 01/01/1995 and 31/12/2004 in any language. We analysed output for country by population, Gross Domestic Product (GDP), burden of disease using DALYs, and language. Results: Overlap between the two databases SCI and SSCI was 35%. 210433 publications were identified after duplicates were removed, a world total of about 20 000 per year. Approximately 7000 papers per year were produced in Europe and 9400 by the USA. Thirteen of 28 individual European countries produced more than 100 public health papers per year. Publications per capita were highest in northern European countries. In multiple regression analyses, GDP was a modest predictor (r(2)=0.53, P<0.02) of publications for European countries, while population size and disability adjusted life years were not significantly related. Smaller countries and lower producers of public health research were more likely to collaborate with other countries. Of the publications, 3.5% were published in a non-English language, with German the most common. Conclusion: There is marked variation in public health publication by country in Europe. Eastern, and southern European countries appear to under-invest in public health research compared with northern European countries and compared to relative health need.

Keywords: Bibliometric, Bibliometrics, Citation, Europe, Literature, Literature Review, Public Health, Public Health Research, Publications, Science Citation Index

? Damiani, G., Sommella, L., Pinnarelli, L., Scopelliti, L. and Ricciardi, W. (2007), The ongoing tendencies in the field of patient safety and risk management techniques: A world-wide bibliometric research from 1990 up to the present. *European Journal of Public Health*, **17** (S2), 197-198

Full Text: [2007\Eur Pub Hea17, 197.pdf](2007/Eur%20Pub%20Hea17,%20197.pdf)

Keywords: Research

# Title: European Journal of Radiology

Full Journal Title: [European Journal of Radiology](http://www.sciencedirect.com/science/journal/0720048X)

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Subject Categories:

: Impact Factor

? Miguel-Dasit, A., Marti-Bonmati, L. and Sanfeliu, P. (2008), Bibliometric analysis of the Spanish MR radiological production (2001-2007). *European Journal of Radiology*, **67** (3), 384-391.

Full Text: [2008\Eur J Rad67, 384.pdf](2008/Eur%20J%20Rad67,%20384.pdf)

Abstract: Objective: To evaluate the number and characteristics of papers on MR imaging written by radiologists in Spain and published in 2001-2007 Medline-indexed journals, including a comparison with the MR research output from German radiological departments. Materials and methods: Specific search profiles were devised to retrieve items from the Medline database. Relationship with the topic and major thematic areas of the articles, publication year, journal, language of publication, and mean impact factors were analyzed. Spanish and the German institutions with the highest MR productivity were identified. Also, the number of articles from Spain and Germany published in their respective official journals (Radiologia and ROFO) was recorded. Results: There were 332 Spanish articles published in 101 different journals. The higher number of papers was published in Spanish radiology and non-radiology journals (n = 105, 32%, mean IF: 0.191). The journal with the higher number of articles was Radiologia (n = 51, 15%). “Neuroradiology” was the most frequent topic (n = 139, 42%). The Spanish productivity on MR imaging was yearly stable (p = 0.67), with the higher percentage of papers (17%) published in 2006. The topic with the higher IF was “neuroradiology” (IF: 2.317). There were no yearly variations for the three major thematic areas (“Neuro imaging”: p = 0.64; “Body imaging”: p = 0.91; and “Non-clinical miscellanea”: p = 0.46). The highest number of MR publications was found in two Spanish institutions (Dr. Peset University Hospital and Vall d’Hebron Hospital) (both, n = 28, 8%). In comparison, there were 1681 articles on MR imaging from Germany, having the two most productive institutions more than 150 papers in this period (University Hospital Essen and Eberhard-Karls University of Tubingen). The adjusted number of articles per million populations was 20.4 for Germany and 8.1 for Spain. A total of 395 (23%) articles originating from Germany were published in the official German radiological journal ROFO. The percentage of articles originating from Spain and Germany published in their respective official journals was statistically different. Discussion: Spanish radiologists published approximately two-third of their MR articles in several non-Spanish journals, while the official Spanish radiological journal Radiologia leads the ranking of Spanish journals. Spanish radiologists are mainly active in the “neuroradiology” topic. The Spanish healthcare sector is the most active. German institutions published more in their official journal ROFO. (C) 2008 Elsevier Ireland Ltd. All rights reserved.

Keywords: Bibliometric, Bibliometric Analysis, Database, Germany, Impact, Impact Factor, Journals, Magnetic Resonance Imaging, Medline, Papers, Productivity, Publication, Publications, Radiology and Radiologists, Research, Research Output, Scientific Journals, Spain, University Hospital

# Title: European Journal of Scientific Research

Full Journal Title: [European Journal of Scientific Research](http://www.eurojournals.com/EJSR.htm)

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ISSN: 1450-216X

Issues/Year:

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: Impact Factor

? Igwe, J.C., Okpareke, O.C. and Abia, A.A. (2006), Removeal of Co(II), Fe(II) and Cu(II) ions from wasterwater using modified and unmodified maize husk: Sorption kinetics and intraparticulate diffusivity. *European Journal of Scientific Research*, **13** (2), 206-212.

Full Text: Eur J Sci Res13, 206.pdf

Abstract: The pollution problems caused by heavy metals the world over is immense, more so, to the increased industrial activities. Heavy metal toxicity is high due to their bioaccummulating tendencies. Hence, their removal or recovery has become pertinent. The Kinetics of sorption and intraparticulate diffusivities of Co2+, Fe2+ and Cu2+ removal using EDTA modified and unmodified maize husk of two different particle sizes of 500μm and 850μm was studied in this paper. The highest sorption rates are 98.08 mg/min for Cu2+, 97.62mg/min for Fe2+ and 93.22 mg/min for Co2+. Modification did not significantly affect the adsorption rate. Co2+ ion sorption on 500μm and 850μm particles size and Cu2+ sorption on 850μm were particle diffusion controlled sorption, whereas the others are film diffusion controlled. The rate of attainment to equilibrium depends on the metal ion type and type or adsorbent. The pseudo -second order rate equation gave a better fit to the sorption process compared to the pseudo-first order rate equation. The pseudo-second order rate constant (K2) was evaluated to be 9.43 ×107 (mg/min), with a correlation coefficient of 0.899. Thus, this study shows that EDTA modified and unmodified maize husk is capable of removing Co2+, Fe2+ and Cu2+ ions from wastewater and also showed their mechanism of sorption. © EuroJournals Publishing, Inc. 2006.

Keywords: Adsorption-Kinetics, Heavy Metal, Intraparticulate Diffusivity, Maize Husk and EDTA

? Abia, A.A., Asuquo, E.D. and Orike, D.B. (2007), Surface transport kinetic models for Pb2+ sorption using unmodified and mercaptoacetic acid modified agricultural-by products. *European Journal of Scientific Research*, **16** (2), 303-316.

Full Text: Eur J Sci Res16, 303.pdf

Abstract: The kinetics of Pb2+ sorption from aqueous solutions using mercaptoacetic acid modified and unmodified oil palm fruit fibre was investigated. Sorption capacity, qt increased following the trend; 1.0MOPF> 0.5 MOPF> UOPF and maximum sorption was attained in 120 minutes. Kinetic modeling of the sorption data using the pseudo-first order, pseudo-second order, Elovich, mass transfer and intraparticle diffusivity models was carried out. The pseudo-second order equation was the best fitting model with r2 = 0.99. Thereby indicating that sorption of Pb2+ on the adsorbents followed a pseudo-second order mechanism. © EuroJournals Publishing, Inc. 2007.

Keywords: Kinetics, Lead, Oil Palm Fruit Fibre, Sorption

? Mahvi, A.H., Gholami, F. and Nazmara, S. (2008), Cadmium biosorption from wastewater by *Ulmus* leaves and their ash. *European Journal of Scientific Research*, **23** (2), 197-203.

Full Text: [2008\Eur J Sci Res23, 197.pdf](2008/Eur%20J%20Sci%20Res23,%20197.pdf)

Abstract: Environmental pollution with heavy metals has become a global phenomenon. The biosorption capability of Ulmus leaves and their ash for Cadmium ions removal from wastewaters has been investigated as a function of appropriate equilibrium time, concentration of adsorbate and pH in a batch system. The effect of other metals such as Ca+2, Mg+2, Na+ and K+ on Cadmium biosorption was studied. Studies showed that equilibrium time to biosorption of Cadmium was 60 minutes. The Cadmium uptake was found to be rapid and reached to 85-92% of equilibrium capacity of biosorption in 15min at optimum pH = 6 and initial concentration 2 mg/Lfor both ULMUS Leaves and their ash, respectively. The effect of these biosorbents on COD variations in wastewater shows that 2 g/L biosorbent increase 130 and 75 mg/L COD in deionized water at 60 minutes for Ulmus Leaves and their ash respectively. The Cadmium biosorption obeyed from both Longmuir and Fraundlich isotherms but Lungmuir isotherm was better by R2 = 0.998 for ash and R2 = 0.993 for Ulmus Leaves. The studies showed that Ulmus Leaves ash was more favorable than Ulmus Leaves in removing Cadmium and thus was a better biosorbent.

Keywords: Biosorption, Cadmium, Ulmus Leaves, Ash, Wastewater

# Title: European Journal of Social Psychology

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? Meertens, R.W., Nederhof, A.J. and Wilke, H.A.M. (1992), Social Psychological-Research in the Netherlands, 1980-1988. *European Journal of Social Psychology*, **22** (1), 93-100.

Full Text: [1992\Eur J Soc Psy22, 93.pdf](1992/Eur%20J%20Soc%20Psy22,%2093.pdf)

Abstract: This paper contains an investigation about research of Dutch social psychologists. Based on reported publications two types of analyses were performed. The reported publications were categorized by means of a topic-inventory proposed by Fisch and Daniel (1982), which enabled us to compare Dutch trends with developments in Europe and the U.S.A. Moreover, by means of bibliometric analyses publications of Dutch social psychologists were related to data obtained by the Institute for Scientific Information (ISI). Several trends were observed and discussed.

Keywords: Analyses, Bibliometric, Bibliometric Analyses, Data, Dutch, Europe, Institute for Scientific Information, Investigation, ISI, Publications, Research, Social, The Netherlands, Trends

# Title: European Journal of Social Sciences

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? Sheeba Jebaseeli Jasmine, D. and Nithyanandam, K. (2011), Growth of earthquake research during 1998 – 2007: A bibliometric study. *European Journal of Social Sciences*, **26** (4), 582-589.

Full Text: [2011\Eur J Soi Sci26, 582.pdf](2011/Eur%20J%20Soi%20Sci26,%20582.pdf)

Abstract: This paper analyses the quantum of earthquake research carried out during the decade 1998 to 2007. The resources that were included in the Web of Science pertaining to earthquake have been considered for this study. The aim of the study was to find out the most productive country; author; institution apart from analyzing the geographical and linguistic distribution and preferred type of publication. The findings show that English is the most preferred language of publication and USA has published the highest number of documents in earthquake research. US Geological Survey tops the institution wise earthquake research productivity. Article seems to be preferred type of document to disseminate the research results during this period. Bulletin of Seismology Society of America is the most productive source that has published the research activities and reports.

Keywords: Earthquake, Seismicity, Research Output, Bibliometrics, Research Productivity

# Title: European Journal of Soil Biology

Full Journal Title: [European Journal of Soil Biology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6227&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=3281709&md5=feae07652e3064cd4e9256b0bab279ff)

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ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Filip, Z. and Hermann, S. (2001), An attempt to differentiate *Pseudomonas* spp. and other soil bacteria by FT-IR spectroscopy. *European Journal of Soil Biology*, **37** (3), 137-143.

Full Text: [E\Eur J Soi Boi37, 137.pdf](E/Eur%20J%20Soi%20Boi37,%20137.pdf)

Abstract: Pseudomonads are ubiquitous bacterial inhabitants of soil and surface water with a variety of metabolic capacities. The isolation and identification of these bacteria is often required. A variety of methods have been employed to confirm the presence of Pseudomonads in different environments. In our experiments we tested the usefulness of infrared signals which deliver fingerprint like patterns that could be used for probing the presence and perhaps also the identity of these bacteria. If cultivated in a minimum nutrient broth, *Pseudomonas aeruginosa*, *Pseudomonas fluorescens*, *Pseudomonas putida*, and *Pseudomonas stutzeri* delivered well differentiated IR spectra in the following waverange: 3300 cm–1 for nucleic acids structures, 3000–2800 cm–1 for cell membrane fatty acids, 1800–1500 cm–1 for cell proteins, 1500–1400 cm–1 for fatty acids, 1500–1200 cm–1 for proteins and phospholipids, 1200–900 cm–1 for glycopeptides and phosphate groups of nucleic acids constituents, 900–550 cm–1 for less defined cell constituents. However, the spectra of the individual species resembled each other. Some differences in the intensity of the individual bands were observed between IR spectra obtained by either the absorption/transmission (A/T) or the attenuated total reflectance (ATR) scanning techniques. Alterations in the composition of nutrient broth resulted in changes of the absorption ratios between the 2925 cm–1 and 1658 cm–1 bands (fatty acids:proteins), and between the 1656 cm–1 and 1080 cm–1 bands (proteins:peptidoglycans/polysaccharides). Some minor differences were observed between freshly harvested and starved cell biomass. Although less laborious and time consuming the FT–IR spectroscopy seems not sensitive enough to become a useful tool in a differentiation of *Pseudomonas* spp.

Keywords: Differentiation, FT-IR Spectra, *Pseudomonas* spp

# Title: European Journal of Soil Science

Full Journal Title: [European Journal of Soil Science](http://www.blackwell-synergy.com/servlet/useragent?func=showIssues&code=ejs); [European Journal of Soil Science](http://www3.interscience.wiley.com/journal/118000649/toc?journal=ejs&CRETRY=1&SRETRY=0); [European Journal of Soil Science](http://web.ebscohost.com/ehost/detail?vid=1&hid=5&sid=a64e8a30-53c1-4a3c-a0e2-acd05282d50f%40sessionmgr14&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&jid=80W)

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Journal Country/Territory: England

Language: English

Publisher: Blackwell Science Ltd

Publisher Address: PO Box 88, Osney Mead, Oxford OX2 0NE, Oxon, England

Subject Categories:

Agriculture, Soil Science: Impact Factor 1.386, 4/29 (2000)

Spark, K.M., Johnson, B.B. and Wells, J.D. (1995), Characterizing heavy-metal adsorption on oxides and oxyhydroxides. *European Journal of Soil Science*, **46** (4), 621-631.

Full Text: [1995\Eur J Soi Sci46, 621.pdf](1995/Eur%20J%20Soi%20Sci46,%20621.pdf)

Abstract: Adsorption of Cu(II), Zn(II), Co(II) and Cd(II) on three different substrates: goethite, alumina and silica, was investigated over the pH range from 3.5 to 10. The consistent variation in the pH at which 50% of the metal is adsorbed (pH5.0) indicates that the identity of the adsorbing ion is the principal factor determining the pH range over which adsorption occurs. However, the nature of the substrate does play a lesser role. The proton coefficient, chi, ranged from about 0.5 to 1.8, and was correlated with the difference between pH (5.0) and the pH for 50% precipitation. It is suggested that for most metal-substrate systems, for which chi is about 1, MOH+ plays a dominant role in adsorption. Increasing the substrate concentration decreased pH5.0 for adsorption of metals on goethite, but there was little change in chi. The change in pH5.0 was inversely related to chi. While the effect of the nature and concentration of the background electrolyte on Cu(II), Zn(II) and Co(II) adsorption depended on the substrate, increased ionic strength was found to decrease Cd(II) adsorption on all substrates.

Spark, K.M., Wells, J.D. and Johnson, B.B. (1995), Characterizing trace metal adsorption on kaolinite. *European Journal of Soil Science*, **46** (4), 633-640.

Full Text: [1995\Eur J Soi Sci46, 633.pdf](1995/Eur%20J%20Soi%20Sci46,%20633.pdf)

Abstract: Adsorption of Cu(II), Zn(II), Co(II) and Cd(II) on kaolinite has been investigated at 25°C as a function of pH, concentration of the substrate and the nature and concentration of the supporting electrolyte. The adsorption edges for three metals (Zn(II), Co(II) and Cd(II)) showed clear evidence of two distinct adsorption processes. As the pH was increased adsorption began at pH 4.5 for all metals, but the fraction of metal adsorbed at the completion of the first stage differed, the order being Zn(II) > Co(II) approximate to Cd(II). The second stage of adsorption had characteristics similar to those for adsorption of the metals on alumina and silica. Type 1 adsorption (the first stage) probably occurs on the permanent negatively charged kaolinite faces, while Type 2 (the second stage) is associated with the variable-charge surfaces. Increasing the concentration of supporting electrolyte (KNO3 or NaCl) dramatically reduced the extent of Type 1 adsorption: at 0.1 M no evidence of this process existed. At intermediate concentrations electrolytes containing K+ suppressed Type 1 adsorption more than those containing Na+.

Notes: highly cited

? McBride, M., Sauvé, S. and Hendershot, W. (1997), Solubility control of Cu, Zn, Cd and Pb in contaminated soils. *European Journal of Soil Science*, **48** (2), 337-346.

Full Text: [1997\Eur J Soi Sci48, 337.pdf](1997/Eur%20J%20Soi%20Sci48,%20337.pdf)

Abstract: We developed a semiempirical equation from metal complexation theory which relates the metal activity of soil solutions to the soil’s pH, organic matter content (OM) and total metal content (MT) The equation has the general form:

pM = a + bpH - c log(MTOM-1),

where pM is the negative logarithm (to base 10) of the metal activity, and a, b and c are constants. The equation successfully predicted free Cu2+ activity in soils with a wide range of properties, including soils previously treated with sewage sludge. The significant correlation of pCu to these measured soil properties in long-contaminated soils suggests that copper activity is controlled by adsorption on organic matter under steady state conditions. An attempt was made from separate published data to correlate total soluble Cu, Zn, Cd and Pb in soils to soil pH, organic matter content and total metal content. For Cu, the total Cu content of the soil was most highly correlated with total soluble Cu. Similarly, total soluble Zn and Cd were correlated with total metal content, but were more strongly related to soil pH than was soluble Cu. Smaller metal solubility in response to higher soil pH was most marked for Zn and Cd, metals that tend not to complex strongly with soluble organics. The organic matter content was often, but not always, a statistically significant variable in predicting metal solubility from soil properties. The solubility of Pb was less satisfactorily predicted from measured soil properties than solubility of the other metals. It seems that for Cu at least, solid organic matter limits free metal activity, whilst dissolved organic matter promotes metal solubility. in soils well-aged with respect to the metal pollutant. Although total metal content alone is not generally a good predictor of metal solubility or activity, it assumes great importance when comparing metal solubility in soils having similar pH and organic matter content.

Keywords: Sludge-Amended Soils, Sewage-Sludge, Copper Activity, Organic-Matter, Trace-Metals, Cadmium, Adsorption, Zinc, Lead, Accumulation

? Oliver, M.A. (1997), Soil and human health: A review. *European Journal of Soil Science*, **48** (4), 573-592.

Full Text: [1997\Eur J Soi Sci48, 573.pdf](1997/Eur%20J%20Soi%20Sci48,%20573.pdf)

Abstract: Soil can affect human health in several ways leading either to specific diseases or to more general ill health. Some illnesses are caused by people’s eating soil (geophagia), or by their inhaling it which can lead to malignancy if the soil contains asbestiform minerals; pathogens in the soil can lead to tetanus and infestations of hookworm, and particles may enter the body through abrasions and cause a form of elephantiasis. Radon from the soil is implicated in some cancers, and poorly drained soil has been linked recently with infant mortality. Most examples of ill health associated with the soil are caused by concentrations of elements in food or water that are either deficient or toxic. These elements include aluminium, arsenic, cadmium, copper, fluorine, iodine, lead, selenium, thallium and zinc. Their concentrations might reflect the natural condition of the soil, or the effects of people’s actions, such as pollution. In isolated subsistence communities that grow their own food, distinct relations between elements and the aetiology of diseases can be identified. Examples include Keshan disease caused by selenium deficiency, and itai-itai disease caused by excess cadmium. Some of the relations between soil and health are uncertain and the causes putative, and they require further research to validate them They include the association of heart disease with poor acid soil, as in the glaciated regions of northern Europe and the coastal plain of the eastern United States of America. Even for well-defined relations it is evident that many are more complex than was originally thought, however, and greater understanding will require multidisciplinary investigation.

Keywords: Malignant Pleural Mesothelioma, Trace-Elements, Drinking-Water, Environmental Exposure, Selenium Deficiency, Alzheimers-Disease, Endemic Goiter, Spatial Scale, Particle-Size, Rare Disease

Logan, E.M., Pulford, I.D., Cook, G.T. and Mackenzie, A.B. (1997), Complexation of Cu2+ and Pb2+ by peat and humic acid. *European Journal of Soil Science*, **48** (4), 685-696.

Full Text: [E\Eur J Soi Sci48, 685.pdf](E/Eur%20J%20Soi%20Sci48,%20685.pdf)

Abstract: The binding of metal to humic substances is problematical. The approaches for studying metal binding to organic matter are briefly reviewed. Ion-selective electrodes (Cu2+ and Pb2+) were used to measure metal complexation by a whole peat and an extracted humic acid (HA) fraction. Scatchard plots and calculation of incremental formation constants were used to obtain values for the binding constants for the metals onto both peat and HA. Both the peat and the humic acid had a larger maximum binding capacity for Pb2+ than for Cu2+ (e.g. at pH = 5 HA gave 0.188 mmol Cu2+ g-1 and 0.564 mmol Pb2+ g-1: peat gave 0.111 mmol Cu2+ g-1 and 0.391 mmol Pb2+ g-1). Overall, the humic acid had a larger metal binding capacity, suggesting that extraction caused conformational or chemical changes. The binding constants (K1) for Cu2+ increased with increasing pH in both peat and humic acid, and were larger in the peat at any given pH (e.g. at pH = 5 HA gave log K1 = 2.63, and peat gave log K1 = 4.47 for Cu2+). The values for Pb2+ showed little change with pH or between peat and humic acid (e.g. at pH = 5 HA gave log K1 = 3.03 and peat gave log K1 = 3.00 for Pb2+). In the peat, Cu2+ may be more able to bind in a 2: 1 stoichiometric arrangement, resulting in greater stability but smaller binding capacity, whereas Pb2+ binds predominantly in a 1: 1 arrangement, with more metal being bound less strongly. Whole peat is considered to be more appropriate than an extracted humic acid fraction for the study of heavy metal binding in organic soils, as this is the material with which metals introduced into an organic soil would interact under natural conditions.

Lothenbach, B., Krebs, R., Furrer, G., Gupta, S.K. and Schulin, R. (1998), Immobilization of cadmium and zinc in soil by Al-montmorillonite and gravel sludge. *European Journal of Soil Science*, **49** (1), 141-148.

Full Text: [E\Eur J Soi Sci50, 141.pdf](E/Eur%20J%20Soi%20Sci50,%20141.pdf)

Abstract: We investigated the potential of montmorillonite, Al-montmorillonite and gravel sludge to immobilize polluting heavy metals in agricultural soil. Batch experiments showed that both Al-montmorillonite and montmorillonite immobilized zinc and cadmium. Zinc was bound specifically on Al-montmorillonite and became increasingly incorporated into the interlayer hydroxy-Al polymer, whereas there was no specific sorption on montmorillonite. Cadmium was bound on montmorillonite and Al-montmorillonite unspecifically by cation exchange, but there was no incorporation into the lattice.

In pot experiments montmorillonite, Al-montmorillonite, or gravel sludge were added to a soil contaminated with zinc and cadmium. Increasing doses of these agents decreased the concentrations of NaNO3-extractable zinc and cadmium. Aluminium-montmorillonite and gravel sludge were more efficient than montmorillonite in immobilizing both zinc and cadmium. Remobilization tests at pH between 4 and 5.5 showed that cadmium and zinc desorbed more easily from montmorillonite than from Al-montmorillonite. Gravel sludge application increased the buffer capacity of the contaminated soil substantially. The binding agents decreased zinc concentrations in red clover (Trifolium pratense), and gravel sludge also reduced the cadmium concentrations.

Keywords: Solid-Solution, Adsorption, Calcite, Surface, Metals

Barrow, N.J. and Whelan, B.R. (1998), Comparing the effects of pH on the sorption of metals by soil and by goethite, and on uptake by plants. *European Journal of Soil Science*, **49** (4), 683-692.

Full Text: [E\Eur J Soi Sci50, 683.pdf](E/Eur%20J%20Soi%20Sci50,%20683.pdf)

Abstract: The effects of soil pH on sorption of cadmium, zinc, nickel and cobalt were studied by changing the pH of a soil and measuring sorption. Results were compared with published results for effects of pH on sorption of cadmium, zinc and nickel by goethite. In a further experiment, the effects of pH on the uptake of zinc and cobalt by subterranean clover were measured.

Effects of pH on sorption were described in terms of the concentration of metal ions required to produce equal sorption. Where the metal ions were incubated with the soil, unit increase in pH decreased the concentration of metal ions required about 10-fold for zinc, about 7-fold for nickel, about 6-fold for cobalt, and about 4-fold for cadmium. When the soil was mixed with a large volume of solution, the effects were similar for zinc and cadmium but slightly smaller for cobalt and slightly larger for nickel. In all cases, the magnitude of the effect varied somewhat with pH. Sorption was greater with a dilute background electrolyte than with a concentrated one and the effects of pH were greater. The effects for soil were smaller than effects of pH on sorption by iron oxides for which unit increase in pH can decrease the required concentration of zinc 35-fold and cadmium II-fold.

These results are consistent with adsorption of divalent ions on a variable charge surface that is negatively charged. They an not consistent with the adsorption of monovalent metal ions on a variable charge surface. This mechanism requires at least a 10-fold effect of pH. They show that the change in electric potential with change in pH is smaller for reacting surfaces in soil than for goethite. The effects of changing pH on the amounts of zinc and cobalt fertilizer required for equal uptake by plants was even smaller with unit increase in pH, causing a 1.4-fold increase in the amount of fertilizer required, that is, a 1.4-fold decrease in fertilizer effectiveness.

Keywords: Charge Mineral Surface, Cadmium, Adsorption, Model, Field, Zinc, Electrolyte, Phosphate

Elzinga, E.J., van Grinsven, J.J.M. and Swartjes, F.A. (1999), General purpose Freundlich isotherms for cadmium, copper and zinc in soils. *European Journal of Soil Science*, **50** (1), 139-149.

Full Text: [E\Eur J Soi Sci50, 139.pdf](E/Eur%20J%20Soi%20Sci50,%20139.pdf)

Abstract: Assessing the accumulation and transport of trace metals in soils and the associated toxicological risks on a national scale requires generally applicable sorption equations. Therefore Freundlich equations were derived for Cd, Zn and Cu using multiple linear regression on batch sorption data from the literature with a wide variety of soil and experimental characteristics, and metal concentrations ranging over five orders of magnitude. Equations were derived based on both total dissolved metal concentrations and free metal activities in solution. Free metal activities were calculated from total metal concentrations taking into account ionic activity, and inorganic tall metals) and organic complexation (Cu only). Cadmium and Zn were present in solution predominantly as free ions, while Cu was present as organic complexes. Since actual dissolved organic carbon (DOC) concentrations were not available they were estimated using an empirical field relation between DOC and organic matter content. The logarithmic transformation of the Freundlich constant for Cd was regressed on the logarithmic transformations of cation exchange capacity (CEC) (H+) and dissolved Ca, and for Zn with CEC and (H+). For Cu the lag-log regression model of the Freundlich constant included the solid: solution ratio of the batch to account for dilution of DOC in the batch as compared with the field. The explained variance for the fitted Freundlich equations was 79% for Cd, 65% for Cu and 83% for Zn, using log-transformed adsorbed concentrations and soil solution activities. The Freundlich adsorption models underestimated metal contents determined from 1M HNO3 digestion on field samples, up to a factor of 6 (Cd and Cu) or 10 (Zn).

Keywords: Partition-Coefficients, Sorption, Adsorption, Waters, pH

Bundt, M., Zimmermann, S., Blaser, P. and Hagedorn, F. (2001), Sorption and transport of metals in preferential flow paths and soil matrix after the addition of wood ash. *European Journal of Soil Science*, **52** (3), 423-431.

Full Text: [E\Eur J Soi Sci52, 423.pdf](E/Eur%20J%20Soi%20Sci52,%20423.pdf)

Abstract: As a consequence of heterogeneous transport in soils, only a small part of the soil might be responsible for sorbing incoming elements. After staining preferential flow paths in forested Dystric Cambisol with a colour dye, we sampled soil material from the flow paths and from the soil matrix. We measured chemical properties and sorption isotherms of these two flow regions and estimated the significance of preferential flow paths for the transport of solutes leached from wood ash applied at the surface. In the A horizon (0-9 cm depth), the cation exchange capacity of the flow paths was 83.8 mmol(c) kg-1, while that of the soil matrix was only 74.6 mmol(c) kg-1. The base saturation was 42% and soil organic matter content was 41% larger in flow paths than in the soil matrix. The sorption capacity for Cu was also larger than in the matrix, whereas the sorption capacity for Sr was similar in both flow regions. The impact of the addition of 8 t wood ash ha-1 on soil chemical properties was restricted mainly to the flow paths in the uppermost 20 cm of the soil, it was negligible in the matrix and at greater depths. Concentrations of exchangeable Ca in the flow paths increased nearly 10-fold during the 6 months following the addition of the wood ash, and those of organically bound Pb by 50%. The opposite effect was found for exchangeable Al. Our results show that only part of the whole soil volume, approximately 50% of 0-20 cm in our study, is involved in transporting and sorbing the elements applied with the wood ash or as tracers. Such differences must be considered when calculating the maximal impact of any addition of fertilizer, wood ash, or liming agent.

Keywords: Communities, Forest Soils, Macropores, Metals, Roots, Soil, Sorption, Water, Wood

Bakhti, A., Derriche, Z., Iddou, A. and Larid, M. (2001), A study of the factors controlling the adsorption of Cr(III) on modified montmorillonites. *European Journal of Soil Science*, **52** (4), 683-692.

Full Text: [E\Eur J Soi Sci52, 683.pdf](E/Eur%20J%20Soi%20Sci52,%20683.pdf)

Abstract: We have examined the way that the metallic ion Cr(III) is held by Na-montmorillonite and alumina pillared clay. We used several physico-chemical methods of analysis (X-ray powder diffraction, infrared absorption spectrometry, thermal analysis and chemical composition) to determine the structural formula of the Na-montmorillonite, and to clarify the effect of the introduction of the Al13 polycations between the clay layers on its physico-chemical and structural properties. Our results show that the strength of chromium retention increases with pH. This effect is more marked in pillared than in unpillared clays. It seems that the mechanism of fixing of the metallic cations on pillared clays is more complex than a simple cationic exchange and involves the surface groups of the pillars. In other words, chromium adsorption on pillared montmorillonite is more like adsorption on an amphoteric oxide surface (such as Al2O3) than on a non-pillared clay.

Neubauer, U., Furrer, G. and Schulin, R. (2002), Heavy metal sorption on soil minerals affected by the siderophore desferrioxamine B: The role of Fe(III) (hydr)oxides and dissolved Fe(III). *European Journal of Soil Science*, **53** (1), 45-55.

Full Text: [E\Eur J Soi Sci53, 45.pdf](E/Eur%20J%20Soi%20Sci53,%2045.pdf)

Abstract: Phytoextraction of heavy metals from polluted soils has often been found to be limited by the bioavailability of the pollutants. Inorganic or organic ligands are occasionally used as complexing agents to enhance the mobility of the heavy metals. However, the opposite effect is also possible. We studied the influence of the hydroxamate siderophore desferrioxamine B (DFOB) on the sorption of Cu, Zn and Cd to clay minerals, with the emphasis on the role of dissolved Fe(III) and Fe(III) minerals. Depending on the surface charge of the minerals and on pH, sorption of heavy metals can be either enhanced or diminished. We show here that this effect of DFOB disappears if dissolved Fe(III) is added to suspensions of clay minerals in excess to DFOB. We found that the solid Fe(III) phases ferrihydrite and goethite did not impede the effect of DFOB on the sorption of heavy metal, however. Between pH 4 and 10, DFOB completely prevented Cu sorption on ferrihydrite. A strong mobilizing effect was also observed for Zn, but not for Cd. In presence of goethite, concentrations of dissolved Cu, Zn and Cd were enhanced only above approximately pH 5, 7 and 8, respectively. Below these pH values the binding of these metals to goethite was even stronger with than without DFOB. In the absence of heavy metals, DFOB-promoted dissolution of ferrihydrite was much faster than that of goethite due to the larger surface area of ferrihydrite. In the alkaline pH range, where sorption of DFOB on the surfaces of the iron oxides was greater, dissolution of both minerals was reduced.

Janssen, R.P.T., Bruggenwert, M.G.M. and Van Riemsdijk, W.H. (2003), Zinc ion adsorption on montmorillonite-Al hydroxide polymer systems. *European Journal of Soil Science*, **54** (2), 347-355.

Full Text: [E\Eur J Soi Sci54, 347.pdf](E/Eur%20J%20Soi%20Sci54,%20347.pdf)

Abstract: Clay-Al hydroxide polymers (CAlHO) can bind heavy metals effectively and may play an important role in the adsorption behaviour and metal binding capacity of soils. We studied the dependence of Al loading and pH on the adsorption of Zn on Na-saturated montmorillonite-Al hydroxide polymer systems. The available binding sites on Al hydroxide polymers (AlHO) had a very strong affinity for Zn ions. Zinc binding on the clay surface became important when the binding sites on the AlHO were nearly all occupied. The pH had a very strong effect on the Zn binding. At pH 6.6 much more Zn could be adsorbed to the AlHO than at pH 5.0. The effect of the Al:clay ratio on Zn binding was influenced by pH. At pH 6.6, Zn binding to the AlHO, expressed per mole AlHO, was independent of the Al:clay ratio, whereas at pH 5.0 this relation was dependent. This is related to the constant charge of the AlHO at pH 6.6, whereas at pH 5.0 the charge decreases with increasing Al:clay ratio. If clay-Al hydroxide polymers are present in the soil their Zn binding to the AlHO will strongly influence the availability of the Zn.

? Chaplain, V., Brault, A., Tessier, D. and Defossez, P. (2008), Soil hydrophobicity: A contribution of diuron sorption experiments. *European Journal of Soil Science*, **59** (6), 1202-1208.

Full Text: [2008\Eur J Soi Sci59, 1202.pdf](2008/Eur%20J%20Soi%20Sci59,%201202.pdf)

Abstract: Retention processes play a major role in the fate and impact of organic contaminants in soils. The main goal of this study was to determine the influence of soil hydrophobic properties on the retention of diuron by using plots of a long-term experiment in Versailles. We selected seven plots with pH 3.4 to 8.2 and low organic content. Sorption isotherms were obtained on soil slurries and kinetic measurements of diuron sorption were performed on undisturbed soil samples. The results showed that the Freundlich coefficient k(f) decreased as pH increased and that the K-oc coefficient, k(f)/TOC, was linearly related to the contact angle measured on the clay fraction over a wide range of pH. A low initial adsorption rate and low adsorption equilibrium were observed for the plot treated with NaNO3. In this case, the structure in micro-aggregates was assumed to limit the accessibility of adsorption sites. The CaCO3 and CaO treated plots had similar organic matter contents, pHs, CECs and bulk densities, although their < 2 mu m:C ratio differed. The higher retention of diuron in the CaCO3 plot is attributed to the higher hydrophobicity of the < 2 mu m fraction, probably masking part of the permanent clay negative charges. Thus, in addition to the different treatments, organic matter composition and distribution should also be included as specific soil properties. We conclude that the sorption properties of pesticides such as diuron can be a good tool to obtain greater understanding of soil properties and the degree of soil hydrophobicity/hydrophilicity in particular.

Keywords: Adsorption, Montmorillonite, Isoproturon, Desorption, Herbicides, Mechanism, Mobility, Equation, Linuron

# Title: European Journal of Sport Science

Full Journal Title: [European Journal of Sport Science](http://www.informaworld.com/smpp/title~db=all~content=t714592354)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

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Subject Categories:

: Impact Factor

? Tsigilis, N., Grouios, G., Tsorbatzoudis, H. and Koidou, I. (2010), Impact factors of the sport sciences journals: Current trends, relative positions, and temporal stability. *European Journal of Sport Science*, **10** (2), 81-90.

Full Text: [2010\Eur J Spo Sci10, 81.pdf](2010/Eur%20J%20Spo%20Sci10,%2081.pdf)

Abstract: The impact factor is a bibliometric index that reflects the frequency with which the oaverage articleo of a scientific journal has been cited in subsequent publications. The purpose of the present study was to examine the current trends of the impact factor of the sport sciences journals, its relative position in relation to journals belonging to other scientific fields, and its temporal stability. Scientific journals’ impact factors classified under the “Sport Sciences” subject category of the Journal Citation Reports (JCR) database from 2000 to 2006 were included in the present study. Results showed that during that period of time, 78 journals appeared in the oSport Scienceso subject category. The mean impact factor rose from 0.851 (median=0.747) in 2000 to 1.178 (median=1.155) in 2006, following a linear trend or even a quadratic trend. The overall mean impact factor of the “Sport Sciences” category was 0.954 (median=0.876). In relation to the other 172 subject categories of the Science Edition of the JCR, oSport Scienceso was placed slightly below the middle for the year 2006. Finally, intra-class correlation coefficients (0.850) suggested that oSport Scienceso journals’ impact factors remained relative stable during the seven years examined.

Keywords: Bibliometric, Bibliometric Index, Citation, Citation Analysis, Database, Evaluating Research, h-Index, Impact, Impact Factor, Impact Factors, Journal Citation Reports, Journals, Medical Journals, Psychology, Publications, Research Output, Research Performance, Science, Scientific Journal, Scientific Journals, Times, Tool, Trends

# Title: European Journal of Vascular and Endovascular Surgery

Full Journal Title: [European Journal of Vascular and Endovascular Surgery](http://www.sciencedirect.com/science/journal/10785884)

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ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Lazarides, M.K., Nikolopoulos, E.S., Antoniou, G.A., Georgiadis, G.S. and Simopoulos, C.E. (2007), Publications in vascular journals: Contribution by country. *European Journal of Vascular and Endovascular Surgery*, **34** (2), 243-245.

Full Text: [2007\Eur J Vas End Sur34, 243.pdf](2007/Eur%20J%20Vas%20End%20Sur34,%20243.pdf)

Abstract: The geographical origin of all published papers in four major vascular journals as well as the “vascular papers” in two high impact “general” surgical journals during a four year period (2003-2006) were examined by search of their electronic editions. As an index of high quality papers, the randomized controlled trials (RCT’s) by country were also examined. A total of 3422 papers were searched in the four vascular journals (115 RCT’s) while 144 “vascular” papers (19 RCT’s) were located in the two “general” surgical journals. It was not surprising that USA and western European countries were having the largest contribution to the vascular literature.

Keywords: Bibliometrics, Literature, Publications by Country, Quality, Randomized Controlled Trials, Vascular Surgery

? Hinnen, J.W., Koning, O.H.J., van Bockel, J.H. and Hamming, J.F. (2007), Aneurysm sac pressure after EVAR: The role of endoleak. *European Journal of Vascular and Endovascular Surgery*, **34** (4), 432-441.

Full Text: 2007\Eur J Vas End Sur34, 432.pdf

Abstract: Objective. The relation between endoleak and aneurysm sac pressure is not completely clear. This review evaluates the effect of endoleaks on aneurysm sac pressure and summarizes the present knowledge regarding aneurysm sac pressure after EVAR. Methods. A systematic search of literature was carried out using MEDLINE, EMBASE and Web of Science. Studies were included if aneurysm sac pressure measurements as well as systemic pressure measurements were performed during or after EVAR. Mean pressure indices (MPI), ratio mean aneurysm sac pressure to mean systemic pressure), in the absence of endoleaks and in the presence of different type of endoleaks were compared. Results. Stent-graft deployment does not seem to result in immediate reduction of aneurysm sac in the absence of an endoleak. Aneurysm sac pressure is elevated in the presence of an endoleak. However, the MPIs differ widely between studies both in the absence and presence of an endoleak. Conclusion. MPI is not specific to the type of endoleak. This implies that the same type of endoleak does not necessarily pose the same MPI and by this the same hazard of aneurysm rupture, because the aneurysm sac pressure is directly related to the aneurysm wall stress. (c) 2007 European Society for Vascular Surgery. Published by Elsevier Ltd. All rights reserved.

Keywords: AAA, Abdominal Aortic Aneurysm, Abdominal Aortic-Aneurysms, Canine Model, Embase, Endoleak, Endoluminal Repair, Endotension, Endotension, Endovascular Repair, Evar, Exclusion, Follow-Up, Graft, ii Endoleaks, In-Vitro, Intraaneurysmal Pressure, Knowledge, Literature, Medline, Methods, Pressure, Ratio, Review, Science, Stress, Systematic, Web of Science

? Bergqvist, D. (2008), The annual meeting of the European Society for Vascular Surgery - The scientific contents over the years. *European Journal of Vascular and Endovascular Surgery*, **36** (1), 114-117.

Full Text: [2008\Eur J Vas End Sur36, 114.pdf](2008/Eur%20J%20Vas%20End%20Sur36,%20114.pdf)

Abstract: Aim and method: to analyze the presentations given at the annual meeting of European Society for Vascular Surgery: topic, geographical distribution, later publication. Three six-year periods from 1989 have been evaluated. Results: case series dominates but randomized trials have increased somewhat. Papers on animal experiments and basic science have decreased. The most frequently reported diseases have been aortic aneurysm, carotid artery problems, tower extremity ischaemia and with an increasing number of papers on venous disease. Around two thirds of the presentations have been later published as full papers in European Journal of Vascular and Endovascular Surgery, but as many as one quarter has not been published. Geographical origin has varied over time with a decrease in the UK dominance. Conclusion: The presentations at the Annual meeting of European Society for Vascular Surgery contribute substantially to the contents of the Society Journal but a large proportion of the presentations never appear in print. Northern Europe dominates when papers per population unit is counted. (C) 2008 European Society for Vascular Surgery. Published by Elsevier Ltd. All rights reserved.

Keywords: Aneurysm, Animal Experiments, Artery, Diseases, Distribution, Europe, Experiments, Ischaemia, Origin, Papers, Population, Publication, Randomized, Rights, Science, UK

? Flu, H.C., Tamsma, J.T., Lindeman, J.H.N., Hamming, J.F. and Lardenoye, J.H.P. (2010), A systematic review of implementation of established recommended secondary prevention measures in patients with PAOD. *European Journal of Vascular and Endovascular Surgery*, **39** (1), 70-86.

Full Text: 2010\Eur J Vas End Sur39, 70.pdf

Abstract: Objective: Since patients with peripheral arterial occlusive disease (PAOD) are at high-risk for cardiovascular morbidity and mortality, preventive measures aimed to reduce cardiovascular adverse events are advocated in the current guidelines. We conducted a systematic review to assess the implementation of secondary prevention (SP) measures in PAOD patients. Methods: PUBMED, Cochrane Library, EMBASE and Web of Science databases were searched to perform a systematic review of the literature from 1999 tilt June 2008 on SP for PAOD patients. Assessment of study quality was done following the Cochrane Library review system. The record outcomes were antiplatelet agents, heart rate towering agents, blood pressure lowering agents, lipid lowering agents, glucose Lowering agents, smoking cessation and walking exercise. Results: From a total of 2137 identified studies, 83 observational studies met the inclusion criteria, of which 24 were included in the systematic review comprising 34 157 patients. These patients suffered from coronary artery disease (n = 3516, 41%), myocardial infraction (n = 2647, 38%), angina pectoris (n = 1790, 31%), congestive heart failure (n = 2052, 14%), diabetes mellitus (n = 10 690, 31%),hypertension (n = 20 823, 73%) and hyperlipidaemia (n = 15 067, 64%). Contrary to what the guidelines prescribe, antiplatelet agents, heart rate towering agents, blood pressure towering agents and lipid towering agents were prescribed in 63%, 34%, 46% and 45% of the patients, respectively. Glucose lowering agents were prescribed in 81% and smoking cessation in 39% of the patients. Conclusion: The majority of patients suffering from PAOD do not receive the entire approach of SP measures as suggested by the current guidelines. To our knowledge, the cause of this undertreatment is multifactorial: patient, physician or heatlh-care-related. (C) 2009 European Society for Vascular Surgery. Published by Elsevier Ltd. All rights reserved.

Keywords: Assessment, Atherosclerotic Vascular-Disease, Blood, Blood Pressure, Cardiovascular, Cochrane, Critical Limb Ischemia, Databases, Diabetes, Diabetes Mellitus, Disease, Embase, Exercise, Exercise Rehabilitation, Guidelines, Heart Rate, High-Risk Patients, Hyperlipidaemia, Implementation, Infrainguinal Bypass, Intermittent Claudication, Knowledge, Lipid, Literature, Lower-Extremity, Methods, Morbidity, Mortality, Myocardial-Infarction, Observational Studies, Occlusive Disease, Outcomes, PAOD, Peripheral Arterial-Disease, Pressure, Prevention, Pubmed, Recommendation, Review, Risk Factor Management, Science, Secondary Prevention, Smoking, Systematic, Systematic Review, Walking, Web of Science

# Title: European Journal of Wood and Wood Products

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: Impact Factor

? Oubagaranadin, J.U.K. and Murthy, Z.V.P. (2009), Removal of Pb(II) from aqueous solutions by carbons prepared from Sal wood (*Shorea robusta*). *European Journal of Wood and Wood Products*, **67** (2), 197-206.

Full Text: [2009\Eur J Woo Woo Pro67, 197.pdf](2009/Eur%20J%20Woo%20Woo%20Pro67,%20197.pdf)

Abstract: In the present work, physically and chemically activated carbons are prepared using Sal wood (Shorea robusta) sawdust by thermal process and using sulfuric acid as the activation agent to remove Pb(II) from aqueous solutions. Adsorption equilibrium studies have been done at a pH of 4 and a room temperature of 30°C. It was found that the adsorption isotherms are favorable and chemically activated carbons are better than physically activated carbon in terms of adsorption capacity. Various two-parameter adsorption isotherm models, viz. Freundlich, Langmuir, Temkin and Dubinin-Radushkevich, were used to fit the equilibrium data and it was found that the Freundlich adsorption model provided best-fit. The first-order irreversible unimolecular reaction model and the pseudo-second-order kinetic models were used to fit the kinetic data and it was found that both the models provided good fit. Kinetic and film diffusion studies show that the adsorption of lead(II) on the activated carbons tested in this work are both intra-particle and film diffusion controlled.

Keywords: Activated Carbon, Activated Carbons, Activation, Adsorbents, Adsorption, Adsorption Capacity, Adsorption Equilibrium, Adsorption Isotherm, Adsorption Isotherm Models, Adsorption Isotherms, Aqueous Solutions, Capacity, Carbon, Data, Diffusion, Equilibrium, Equilibrium Studies, Film Diffusion, First Order, Freundlich, Heavy-Metals, Isotherm, Isotherms, Kinetic, Kinetic Models, Langmuir, Lead, Lead(II), Model, Models, Pb(II), pH, Potential Theory, Pseudo Second Order, Pseudo-Second-Order, Removal, Room Temperature, Sawdust, Solutions, Sorption, Temperature, Waste-Water, Wood, Work

? Kamari, A., Wan Ngah, W.S. and Wong, L.W. (2009), Shorea dasyphylla sawdust for humic acid sorption. *European Journal of Wood and Wood Products*, **67** (4), 417-426.

Full Text: [2009\Eur J Woo Woo Pro67, 417.pdf](2009/Eur%20J%20Woo%20Woo%20Pro67,%20417.pdf)

Abstract: The efficacy of Shorea dasyphylla sawdust as an adsorbent for the removal of humic acid from aqueous solution was investigated as a function of pH value, agitation period, agitation rate, initial humic acid concentration and adsorbent dosage. The equilibrium nature of humic acid adsorption was described by the Langmuir, Freundlich and BET isotherms. The experimental adsorption data was best fitted to the Langmuir adsorption model, which gave adsorption capacity of 68.4 mg humic acid adsorbed per gram Shorea dasyphylla sawdust at pH 2.0 and initial humic acid concentration of 80 mgaEuro-L-1. Kinetic studies indicated that the sorption process followed the pseudo-second-order kinetic model. It was revealed that after three cycles of adsorption and desorption, Shorea dasyphylla sawdust retained its promising adsorption ability. With an initial amount of 73.5 mg humic acid adsorbed per gram sawdust, more than 80% of humic acid desorbed by using 0.1 M HCl. Fourier transform infrared spectroscopy (FTIR) and scanning electron microscopy (SEM) were employed to study the mechanism of the removal of humic acid. From the dimensionless factor, R-L data, it was determined that the adsorption of humic acid onto untreated Shorea dasyphylla sawdust was favourable.

Keywords: Adsorbent, Adsorbent Dosage, Adsorption, Adsorption Capacity, Agitation, Aqueous Solution, Aqueous-Solution, BET, Capacity, Chitosan Hydrogel Beads, Chromium Removal, Concentration, Cu(II), Data, Desorption, Efficacy, Electron Microscopy, Equilibrium, Experimental, Fly-Ash, Freundlich, FTIR, Function, Heavy-Metals, Humic Acid, Infrared Spectroscopy, Ions, Isotherms, Kinetic, Kinetic Model, Kinetic Studies, Langmuir, Mechanism, Model, Nov, pH, pH Value, Pseudo Second Order, Pseudo-Second-Order, Pseudo-Second-Order Kinetic Model, Removal, Sawdust, Scanning Electron Microscopy, SEM, Solution, Sorption, Sorption Process, Spectroscopy, Treated Sawdust, Value, Waste-Water

# Title: European Mass Spectrometry

Full Journal Title: European Mass Spectrometry

ISO Abbreviated Title: Eur. Mass Spectrom.

JCR Abbreviated Title: Eur Mass Spectrom

ISSN: 1356-1049

Issues/Year: 6

Journal Country/Territory: England

Language: English

Publisher: Im Publications

Publisher Address: 6 Charlton Mill, Charlton, Chichester, W Sussex, England PO18 0HY

Subject Categories:

Physics, Atomic, Molecular & Chemical: Impact Factor 1.411, 17/30 (2001)

Spectroscopy: Impact Factor 1.411, 21/40 (2001)

? Thanner, R., Oser, H. and Grotheer, H.H. (1998), Time-resolved monitoring of aromatic compounds in an experimental incinerator using an improved jet-resonance-enhanced multi-photon ionization system Jet-REMPI. *European Mass Spectrometry*, **4** (3), 215-222.

# Title: European Neuropsychopharmacology

Full Journal Title: [European Neuropsychopharmacology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=4910&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=d7b94dbafce901a1cac4f4d6148e247a)

ISO Abbreviated Title: Eur. Neuropsychopharmacol.

JCR Abbreviated Title: Eur Neuropsychopharm

ISSN: 0924-977X

Issues/Year: 6

Journal Country/Territory: Netherlands

Language: English

Publisher: Elsevier Science BV

Publisher Address: Po Box 211, 1000 Ae Amsterdam, Netherlands

Subject Categories:

Clinical Neurology: Impact Factor 2.437, / (2001)

Neurosciences: Impact Factor 2.437, / (2001)

Pharmacology & Pharmacy: Impact Factor 2.437, / (2001)

Psychiatry: Impact Factor 2.437, / (2001)

Vita, A., Dieci, M. and Tenconi, F. (1996), A meta-analysis of magnetic resonance imaging studies in schizophrenia. *European Neuropsychopharmacology*, **6** (4), S4.

Full Text: [E\Eur Neu6, S4.pdf](E/Eur%20Neu6,%20S4.pdf)

Abstract: Since 1984, a large number of studies performed with Magnetic Resonance Imaging (MRI) have been published on the issue of cerebral morphology of schizophrenic patients (Chua and McKenna, 1995).

The background of this research derives from Computed Tomographic (CT) studies, that demonstrated an enlargement of the cerebral ventricular system and a mild degree of cortical atrophy in schizophrenia. MRI, besides being more safe in terms of biological risk, allows the evaluation of specific cerebral structures and a better differentiation of white and gray matter. However, the extreme variability of cerebral morphology, both in healthy subjects and in schizophrenic patients, and the low number of subjects evaluated in each study, explain the large discordance of results obtained in different studies.

In order to overcome this fragmentation of results and to reach more insight into the significance of reported findings, we performed a meta-analysis of MRI studies performed on neuromorphological differences between schizophrenic patients and comparison subjects.

With this aim, we collected all studies published between 1984 and June 1995 fulfilling the following criteria: -having been published in one of the first 18 psychiatric journals defined according to their ranking by Impact Factor (SCI) Journal Citation Reports, 1993), -reporting quantitative data comparing cerebral structures dimensions between schizophrenic patients and non-psychiatric controls, -not reporting analyses of subsamples derived from larger samples already considered in the review.

In this way, we selected a number of studies from which it was possible to obtain enough data to perform a meta-analysis of differences of volumes of the following structures: total brain, lateral ventricles, frontal lobe, temporal lobe, superior temporal gyrus, hippocampus-amygdala complex and basal ganglia.

For each structure we calculated the global effect size (corrected or not for the dimension of each study sample). Then, we evaluated the influence of several variables, especially clinical, potentially confounding the effect size estimation.

Finally, in order to control for the most considerable problem afflicting meta-analyses, i.e. the publication bias (less likelihood of publication for studies reporting negative results), we used a particular method aimed at evaluating the possible influence of this bias on results emerging from the meta-analysis.

The results of this analysis confirm the existence of a complex, multisite brain pathomorphology in schizophrenia.

? Goodwin, R.D., Faravelli, C., Rosi, S., Cosci, F., Truglia, E., de Graaf, R. and Wittchen, H.U. (2005), The epidemiology of panic disorder and agoraphobia in Europe. *European Neuropsychopharmacology*, **15** (4), 435-443.

Full Text: 2005\Eur Neu15, 435.pdf

Abstract: A literature search, in addition to expert survey, was performed to estimate the size and burden of panic disorder in the European Union (EU). Epidemiologic data from EU countries were critically reviewed to determine the consistency of prevalence estimates across studies and to identify the most pressing questions for future research. A comprehensive literature search focusing on epidemiological studies in community and clinical settings in European countries since 1980 was conducted (MEDLINE, Web of Science, Psychinfo). Only studies using established diagnostic instruments on the basis of DSM-III-R or DSM-IV, or ICD-10 were considered. Thirteen studies from a total of 14 countries were identified. Epidemiological findings are relatively consistent across the EU. The 12-month prevalence of panic disorder and agoraphobia without history of panic were estimated to be 1.8% (0.7-2.2) and 1.3% (0.7-2.0) respectively across studies. Rates are twice as high in females and age of first onset for both disorders is in adolescence or early adulthood. In addition to comorbidity with agoraphobia, panic disorder is strongly associated with other anxiety disorders, and a wide range of somatoform, affective and substance use disorders. Even subclinical forms of panic disorder (i.e., panic attacks) are associated with substantial distress, psychiatric comorbidity and functional impairment. In general health primary care settings, there appears to be substantial underdiagnosis and undertreatment of panic disorder. Moreover, panic disorder and agoraphobia are poorly recognized and rarely treated in mental health settings, despite high health care utilization rates and substantial long-term disability. (c) 2005 Elsevier B.V. and ECNP. All rights reserved.

Keywords: Agoraphobia, Anxiety, Anxiety Disorders, Burden, Community Sample, Comorbidity, Disorder, Distress, Dsm-Iii-R, Dsm-Iv, Epidemiology, Europe, Functional, General-Population, Health Care, History, Literature, Major Depression, Mental Health, Mental-Health Survey, Panic Attacks, Panic Disorder, Prevalence, Primary, Primary Care, Psychiatric-Disorders, Research, Science, Suicide Attempts, Survey, United-States, Utilization, Web of Science, Young-Adults

# Title: European Physical Journal B

Full Journal Title: [European Physical Journal B](http://www.springerlink.com/(1wxsgsukflypij55bqwxmk55)/app/home/journal.asp?referrer=backto&backto=linkingpublicationresults,1:101159,1;&absoluteposition=28#A28)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 1434-6028

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Redner, S. (1998), How popular is your paper? An empirical study of the citation distribution. *European Physical Journal B*, **4** (2), 131-134.

Full Text: [1998\Eur Phy J B4, 131.pdf](1998/Eur%20Phy%20J%20B4,%20131.pdf)

Abstract: Numerical data for the distribution of citations are examined for: (i) papers published in 1981 in journals which are catalogued by the Institute for Scientific Information (783,339 papers) and (II) 20 years of publications in Physical Review D: vols. 11-50 (24,296 papers). A Zipf plot of the number of citations to a given paper versus its citation rank appears to be consistent with a power-law dependence for leading rank papers, with exponent close to -1/2. This, in turn, suggests that the number of papers with x citations, N(x), has a large-x power law decay N(x) similar to x(-alpha); with alpha approximate to 3.

Keywords: Publications

? Goldstein, M.L., Morris, S.A. and Yen, G.G. (2004), Problems with fitting to the power-law distribution. *European Physical Journal B*, **41** (2), 255-258.

Full Text: [2004\Eur Phy J B41, 255.pdf](2004/Eur%20Phy%20J%20B41,%20255.pdf)

Abstract: This short communication uses a simple experiment to show that fitting to a power law distribution by using graphical methods based on linear fit on the log-log scale is biased and inaccurate. It shows that using maximum likelihood estimation (MLE) is far more robust. Finally, it presents a new table for performing the Kolmogorov-Smirnov test for goodness-of-fit tailored to power-law distributions in which the power-law exponent is estimated using MLE. The techniques presented here will advance, the application of complex network theory by allowing reliable estimation of power-law models from data and further allowing quantitative assessment of goodness-of-fit of proposed power-law models to empirical data.

Keywords: Complex Networks, Internet, Lotka’s Law, Web

# Title: European Physical Journal C

Full Journal Title: European Physical Journal C

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Notes: highly cited

? Caso, C., Conforto, G., Gurtu, A., Aguilar-Benitez, M., Amsler, C., Barnett, R.M., Burchat, P.R., Carone, C.D., Dahl, O., Doser, M., Eidelman, S., Feng, J.L., Goodman, M., Grab, C., Groom, D.E., Hagiwara, K., Hayes, K.G., Hernandez, J.J., Hikasa, K., Honscheid, K., James, F., Mangano, M.L., Manohar, A.V., Monig, K., Murayama, H., Nakamura, K., Olive, K.A., Piepke, A., Roos, M., Schindler, R.H., Shrock, R.E., Tanabashi, M., Tornqvist, N.A., Trippe, T.G., Vogel, P., Wohl, C.G., Workman, R.L., Yao, W.M., Armstrong, B., Casas Serradilla, J.L., Filimonov, B.B., Gee, P.S., Lugovsky, S.B., Mankov, S., Nicholson, F., Babu, K.S., Besson, D., Biebel, O., Cahn, R.N., Crawford, R.L., Dalitz, R.H., Damour, T., Desler, K., Donahue, R.J., Edwards, D.A., Erler, J., Ezhela, V.V., Fasso, A., Fetscher, W., Froidevaux, D., Gaisser, T.K., Garren, L., Geer, S., Gerber, H.J., Gilman, F.J., Haber, H.E., Hagmann, C., Hinchliffe, I., Hogan, C.J., Hohler, G., Jackson, J.D., Johnson, K.F., Karlen, D., Kayser, B., Kleinknecht, K., Knowles, I.G., Kolda, C., Kreitz, P., Langacker, P., Landua, R., Littenberg, L., Manley, D.M., March-Russell, J., Nakada, T., Quinn, H., Raffelt, G., Renk, B., Ronan, M.T., Rosenberg, L.J., Schmitt, M., Schramm, D.N., Scott, D., Sjostrand, T., Smoot, G.F., Spanier, S., Srednicki, M., Stanev, T., Suzuki, T., Tkachenko, N.P., Valencia, G., VanBibber, K., Voss, R., Wolfenstein, L. and Youssef, S. (1998), Review of particle physics. *European Physical Journal C*, **3** (1-4), 1-783.

Full Text: [1998\Eur Phy J C3, 1.pdf](1998/Eur%20Phy%20J%20C3,%201.pdf)

Notes: highly cited

? Groom, D.E., guilar-Benitez, M., Amsler, C., Barnett, R.M., Burchat, P.R., Carone, C.D., Caso, C., Conforto, G., Dahl, O., Doser, M., Eidelman, S., Feng, J.L., Gibbons, L., Goodman, M., Grab, C., Gurtu, A., Hagiwara, K., Hayes, K.G., Hernandez, J.J., Hikasa, K., Honscheid, K., Kolda, C., Mangano, M.L., Manohar, A.V., Masoni, A., Monig, K., Murayama, H., Nakamura, K., Navas, S., Olive, K.A., Pape, L., Piepke, A., Roos, M., Tanabashi, M., Tornqvist, N.A., Trippe, T.G., Vogel, P., Wohl, C.G., Workman, R.L., Yao, W.M., Armstrong, B., Casas Serradilla, J.L., Filimonov, B.B., Gee, P.S., Lugovsky, S.B., Nicholson, F., Babu, K.S., Besson, D., Biebel, O., Bloch, P., Cahn, R.N., Cattai, A., Chivukula, R.S., Cousins, R.D., Damour, T., Desler, K., Donahue, R.J., Edwards, D.A., Erler, J., Ezhela, V.V., Fasso, A., Fetscher, W., Froidevaux, D., Fukugita, M., Gaisser, T.K., Garren, L., Geer, S., Gerber, H.J., Gilman, F.J., Haber, H.E., Hagmann, C., Hinchliffe, I., Hogan, C.J., Hohler, G., Igo-Kemenes, P., Jackson, J.D., Johnson, K.F., Karlen, D., Kayser, B., Klein, S.R., Kleinknecht, K., Knowles, I.G., Kolb, E.W., Kreitz, P., Landua, R., Langacker, P., Littenberg, L., Manley, D.M., March-Russell, J., Nakada, T., Quinn, H.R., Raffelt, G., Renk, B., Rolandi, L., Ronan, M.T., Rosenberg, L.J., Sadrozinski, H.F.W., Sanda, A.I., Schmitt, M., Schneider, O., Scott, D., Seligman, W.G., Shaevitz, M.H., Sjostrand, T., Smoot, G.F., Spanier, S., Spieler, H., Srednicki, M., Stahl, A., Stanev, T., Suzuki, M., Tkachenko, N.P., Turner, M.S., Valencia, G., VanBibber, K., Voss, R., Ward, D., Wolfenstein, L. and Womersley, J. (2000), Review of particle physics. *European Physical Journal C*, **15** (1-4), 1-878.

Full Text: 2000\Eur Phy J C15, 1.pdf

Abstract: This biennial Review summarizes much of Particle Physics. Using data from previous editions, plus 2000 new measurements from 610 papers, we list, evaluate, and average measured properties of gauge bosons, leptons, quarks, mesons, and baryons. We also summarize searches for hypothetical particles such as Higgs bosons, heavy neutrinos, and supersymmetric particles. All the particle properties and search limits are listed in Summary Tables. We also give numerous tables, figures, formulae, and reviews of topics such as the Standard Model, particle detectors, probability, and statistics. A booklet is available containing the Summary Tables and abbreviated versions of some of the other sections of this full Review. All tables, listings, and reviews (and errata) are also available on the Particle Data Group website: http://pdg.lbl.gov.

Keywords: Data, Model, Papers, Particle, Particles, Reviews, Statistics

# Title: European Planning Studies

Full Journal Title: [European Planning Studies](http://taylorandfrancis.metapress.com/(5snb0tboi5whyl555dicdvur)/app/home/journal.asp?referrer=backto&backto=linkingpublicationresults,1:104491,1;&absoluteposition=2#A2)

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ISSN: 0965-4313

Issues/Year:

Journal Country/Territory:

Language:

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Subject Categories:

: Impact Factor

? Héraud, J.A. (2003), Regional innovation systems and European research policy: Convergence or misunderstanding? *European Planning Studies*, **11** (1), 41-56.

Full Text: [2003\Eur Pla Stu11, 41.pdf](2003/Eur%20Pla%20Stu11,%2041.pdf)

Abstract: In this article the question of interfacing, innovation policy and regional policy at the European level is addressed. Under which conditions will the new European research policy, relying on networks of centres of excellence, be compatible with ‘cohesion’ objectives? Since there will be no unique regional development scheme based on science and technology, how can policy-makers take into consideration the variety of local contexts? The analysis focuses on the fact that the concept of regional innovation system can be misleading for describing the territorial context. However, a cognitive approach seems possible, based on the notion of regional competence to innovate. The analyses are illustrated with empirical results concerning the French regions, and especially Alsace.

? Casper, S. and Karamanos, A. (2003), Commercializing science in Europe: The cambridge biotechnology cluster. *European Planning Studies*, **11** (7), 805-822.

Full Text: [2003\Eur Pla Stu11, 805.pdf](2003/Eur%20Pla%20Stu11,%20805.pdf)

Abstract: The article examines the variety of linkages firms have established with university science. These include using universities as a source of ideas for start-ups, scientific collaboration between firms and laboratories, the role of scientists on the scientific advisory boards of firms, and the role of universities in supplying firms with a labour market for talented scientists. These linkages are plentiful across Cambridge area biotechnology firms. However, and perhaps surprisingly, our evidence shows that a key actor, the University of Cambridge does not dominate the scientific linkages of the area’s firms. A large percentage of Cambridge’s firms do not derive from its university. The majority of scientific collaborations are not with University of Cambridge laboratories, nor do Cambridge scientists dominate the scientific advisory boards of firms. Moreover, the majority of scientists within area biotechnology firms appear not to have left University of Cambridge laboratories to move to industry.

? Coronado, D., Acosta, M. and Leon, D. (2004), Regional planning of R&D and science-technology interactions in Andalucia: A bibliometric analysis of patent documents. *European Planning Studies*, **12** (8), 1075-1095.

Full Text: [2004\Eur Pla Stu12, 1075.pdf](2004/Eur%20Pla%20Stu12,%201075.pdf)

Abstract: Andalucia is a southern European LFR (less-favoured region) with a high degree of self-government that has allowed it to design its own R&D policies that complement those implemented throughout Spain and the European Union (EU). Recent the Regional Government passed the Third Andalucian Research Plan 2000-2003, an R&D planning instrument that, as has become customary in previous Plans, attributes considerable budgetag weight to the scientific aspects of the science-technology-industry system (Andalucia allocates more of its own resources to promoting research than any other region in Spain). This paper provides deeper insight into the role played by science in driving the technological development of Andalucia, one of the LFRs of the EU. The aim was to answer five fundamental questions: How is basic science utilized by industry in Andalucia? Which sectors are the most dynamic in the employment of scientific know-how? Which scientific fields are most in demand by industty? Which types of institution utilize scientific knowledge most profusely? What delay is there in incorporating science into technology The methodologv that has been applied for investigating the links between science and technology is based on scientific citations in patent documents (NPC). The results in this article provide relevant information about the interconnection of scientific and technological systems and thus constitute a good point of reference for the development of future RD plans.

Keywords: Academic Research, Basic Research Literature, Bibliometric, Bibliometric Analysis, Citations, Development, Districts, EU, European Union, Industrial Innovations, Knowledge Flows, Linkage, Patent, Public Science, R&D, Research, Science and Technology, Spain, Triple-Helix, University

? Cooke, P. (2006), Global bioregional networks: A new economic geography of bioscientific knowledge. *European Planning Studies*, **14** (9), 1265-1285.

Full Text: [2006\Eur Pla Stu14, 1265.pdf](2006/Eur%20Pla%20Stu14,%201265.pdf)

Abstract: Regional capabilities and knowledge domain theses are proposed. Global biotechnology dynamics are analysed. Detailed research on Europe’s leading bioeconomy, the UK, is presented Global network analysis is performed based on research into collaborations between “star” scientists and their institutes in bioregions at a global scale, with regard to joint publication of bioscientific articles in US and European Union (EU) Science Citation Index representative and leading cited journals. The originality here lies in identifying the hierarchical structure and main network axes in the global bioscientific research system. The results show the expected in that the strongest bioregions are in North America, particularly around Boston, San Diego and San Francisco. For collaboration, using this measure, Sweden is revealed as a strong European research base, as is the UK. New bioregions are found rising in Asia, and Japan for long quiescent has at last begun to move.

Keywords: Biotechnology Industry, Business, Citation, Cluster, Collaboration, Innovation, Journals, Research, Spillovers, US

# Title: European Political Science

Full Journal Title: [European Political Science](http://www.palgrave-journals.com/eps/archive/index.html); [European Political Science](http://www.palgrave-journals.com.ludwig.lub.lu.se/eps/archive/index.html)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? David, M.E. (2008), Research quality assessment and the metrication of the social sciences. *European Political Science*, **7** (1), 52-63.

Full Text: [2008\Eur Pol Sci7, 52.pdf](2008/Eur%20Pol%20Sci7,%2052.pdf)

Abstract: The British system of quality assessment of research in universities, known as the Research Assessment Exercise (RAE), has recently been the subject of major public policy review and debate. The system of research quality or performance assessment has been running for over twenty years, although many of its facets have changed as has the increasingly marketised political economy. Nevertheless, the UK RAE has been the prototype for the growth and development of such systems internationally, although how different countries have conceived of such forms of review has varied greatly. The question of the relationship between research quality in higher education and the public funding of research lies at the heart of what has become a contentious and acrimonious debate in the UK. While these issues can be seen as fundamentally about social and economic matters, in fact the social sciences as an organised group of subjects or interests have not played a key role in the public arena. This article outlines the contours of the recent debates in the UK, by comparison and contrast with the ways in which such systems of performance and quality assessment have been debated inter alia in Australia, New Zealand, France and the Netherlands. In essence, the issues have centred upon questions of measurement of performance known as metrication, and bibliometrics versus social judgments about research quality.

Keywords: Assessment, Bibliometrics, Countries, Development, Education, France, Growth, Impact of Research, Measurement, Peer Review, Performance Indicators, Privatisation, Quality, Quality Assurance, Research, Sciences, System

? Harguindéguy, J.B. and Canton, J. (2009), Is French policy analysis in crisis? A first critical appraisal. *European Political Science*, **8** (1), 90-103.

Full Text: [2009\Eur Pol Sci8, 90.pdf](2009/Eur%20Pol%20Sci8,%2090.pdf)

Abstract: This article questions the so-called ‘crisis’ in French policy analysis, a sub-field that supposedly suffers from its closedness with respect to the international mainstream. Through a bibliometric analysis, we confirm that policy analysis has established itself as an important research area in French political science. Then, we demonstrate that the level of internationalisation of French policy analysis has grown considerably despite domestic authors’ and approaches’ continued monopolisation of this sub-field.

Keywords: American-Political-Science, Analysis, Authors, Bibliometric, Bibliometric Analysis, Bibliometry, Crisis, Departments, First, France, French, Institutionalism, International, Internationalisation, Life, Mar, New Institutionalism, Organizational-Factors, Policy, Policy Analysis, Ranking, Research, Respect, Science, Sub-Field

? Schneider, J.W. (2009), An outline of the bibliometric indicator used for performance-based funding of research institutions in Norway. *European Political Science*, **8** (3), 364-378.

Full Text: [2009\Eur Pol Sci8, 364.pdf](2009/Eur%20Pol%20Sci8,%20364.pdf)

Abstract: This article outlines and discusses the bibliometric indicator used for performance-based funding of research institutions in Norway. It is argued that the indicator is novel and innovative as compared to the indicators used in other funding models. It compares institutions based on all their publication-based research activities across all disciplines. Specific incentives are given to researchers to focus their publication behaviour on the most ‘prestigious’ publication channels within the different fields. Such aims necessitate a documentation system based on high-quality data, and require differentiated publication counts as the basic measure. Experience until now suggests that the indicator works as intended.

Keywords: Bibliometric Indicators, Co-Authorship, Consequences, Impact, Indicators, Performance-Based Funding, Publication Counts, Research, Research Institutions, Science

# Title: European Polymer Journal

Full Journal Title: [European Polymer Journal](http://sdos.ejournal.ascc.net/cgi-bin/sciserv.pl?collection=journals&journal=00143057); [European Polymer Journal](http://www.sciencedirect.com/science/journal/00143057)

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JCR Abbreviated Title: Eur Polym J

ISSN: 0014-3057

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Journal Country/Territory: England

Language: Multi-Language

Publisher: Pergamon-Elsevier Science Ltd

Publisher Address: The Boulevard, Langford Lane, Kidlington, Oxford OX5 1GB, England

Subject Categories:

Polymer Science: Impact Factor 0.745, 30/69 (2000); Impact Factor 2.113, 15/75 (2006)

Trivedi, H.C., Patel, V.M. and Patel, R.D. (1973), Adsorption of cellulose triacetate on calcium silicate. *European Polymer Journal*, **9** (6), 525-531.

Full Text: [1960-80\Eur Pol J9, 525.pdf](1960-80/Eur%20Pol%20J9,%20525.pdf); [E\Eur Pol J9, 525.pdf](E/Eur%20Pol%20J9,%20525.pdf)

Abstract: Adsorption of cellulose triacetate from its chloroform solution on calcium silicate has been studied. The adsorption follows first order kinetics. The adsorption data are adequately described by the Langmuir isotherm indicating that the adsorbed polymer molecules behave as rigid molecules in the adsorbed state. An attempt has been made to fractionate cellulose triacetate employing the adsorption technique.

Keywords: Adsorption, Calcium, England, Science

Kesenci, K., Say, R. and Denizli, A. (2002), Removal of heavy metal ions from water by using poly(ethyleneglycol dimethacrylate-co-acrylamide) beads. *European Polymer Journal*, **38** (7), 1443-1448.

Full Text: [E\Eur Pol J38, 1443.pdf](E/Eur%20Pol%20J38,%201443.pdf)

Abstract: Poly(ethyleneglycol dimethacrylate-co-acrylamide) (poly(EDGMA-co-AAm)) copolymer beads have been prepared for use in the separation Pb(II), Hg(II), and Cd(II), metal ions in aqueous solution by a batch equilibration technique. Adsorption capacity were increased with pH for Pb(II), Cd(II) and Hg(II) and then reached almost plateau value around 6.0. The high initial rate of metal ions uptake (<10 min) suggests that the adsorption occurs mainly at the bead surface. The metal uptake results show that poly(EGDMA-co-AAm) can be used for the adsorption of the following metals in the indicated order: Pb(II) > Cd(II) > Hg(II) expressed on a molar basis. However, when the uptake was expressed in terms of the amount of metal removed from solution was as follows: Pb(II) > Hg(II) > Cd(II). The beads still showed preference toward Pb(II) when this metal was in a mixture with Hg(II) and Cd(II). A linearized form of the Freundlich and the Langmuir isotherm model fits the experimental equilibrium concentration data of Hg(II) and Cd(II) better than isotherm type model of Pb(II). The recovery of the metal ions after adsorption and the regeneration of the adsorbent can be carried out by treatment of the loaded beads with either 0.5 M NaCl, or 1 M HNO3. (C) 2002 Elsevier Science Ltd. All rights reserved.

Keywords: Poly(Egdma-Co-Aam) Beads, Heavy Metals, Adsorption, Desorption, Polystyrene Microspheres, Microbeads, Polymers, Cadmium, Workers

? El-Sherbiny, I.M. (2009), Synthesis, characterization and metal uptake capacity of a new carboxymethyl chitosan derivative. *European Polymer Journal*, **45** (1), 199-210.

Full Text: [2009\Eur Pol J45, 199.pdf](2009/Eur%20Pol%20J45,%20199.pdf)

Abstract: Chemical modification of chitosan (Cs) and its derivatives via graft copolymerization can enhance their properties and consequently expands their potential applications. Carboxymethyl chitosan (CMCs) was prepared and characterized by FTIR spectroscopy, elemental analysis and X-ray diffraction. Graft copolymerization of N-acryloylglycine (NAGly) onto CMCs; using 2,2-dimethoxy-2-phenyl acetophenone (PI) as photoinitiator was carried out under nitrogen atmosphere in aqueous solution. Evidence of grafting was confirmed by comparison of FTIR spectra of CMCs and the graft copolymers as well as the 2D-X-ray diffraction patterns, elemental analysis and the difference in solubility profiles before and after grafting. The effects of concentration of NAGly, PI and reaction time on the extent of grafting were investigated by determining the grafting percentage and grafting efficiency. With other conditions kept constant, the obtained optimum grafting conditions were: CMCs = 0.1 g, NAGly = 0.4 g, PI = 0.02 g and reaction time = 1 h. A preliminary study was then carried out to evaluate the capacity of the prepared new graft copolymer to uptake copper ions from aqueous systems. This preliminary investigation of the prepared graft copolymers showed that they may be tailored and exploited to expand the utilization of these systems in metal ions uptake and treatment of wastewater. (C) 2008 Elsevier Ltd. All rights reserved.

Keywords: Aggregation Behavior, Antibacterial Activity, Aqueous-Solution, Biological-Activity, Carboxymethyl Chitosan, Chemical-Modification, Chitins, Chitosan, Copper, Graft-Copolymerization, Metal Uptake, Methacrylate, Methyl Acrylate, Modification, N-Acryloylglycine, Swelling

? Aluigi, A., Tonetti, C., Vineis, C., Tonin, C. and Mazzuchetti, G. (2011), Adsorption of copper(II) ions by keratin/PA6 blend nanofibres. *European Polymer Journal*, **47** (9), 1756-1764.

Full Text: [2011\Eur Pol J47, 1756.pdf](2011/Eur%20Pol%20J47,%201756.pdf)

Abstract: Mats of randomly oriented nanosized filaments, prepared by electrospinning wool keratin/polyamide 6 blends in formic acid, were evaluated as adsorbents of Cu2+ ions. The adsorption capacity was evaluated as a function of the nanofibre composition, specific surface area, initial metal ion concentration, contact time and pH of the solution. The adsorption tests revealed that keratin-based nanofibres highly adsorb Cu2+ ions and the adsorption capacity increases with increasing the specific surface area of the nanofibre mats. The maximum adsorption capacities for nanofibre mats containing 50%, 70% and 90% (wt.%) of keratin were found to be 61.7 (mg/g), 90 (mg/g) and 103.5 (mg/g), respectively. The Cu2+adsorption onto the keratin rich nanofibres is highly pH-dependent and the optimum pH was found above the isoelectric point of keratin. The experimental data fit the pseudo second-order kinetic model. Infrared analysis demonstrated the formation of complexes between Cu2+ ions and keratin that involve terminal free carboxyl groups of the protein. (C) 2011 Elsevier Ltd. All rights reserved.

Keywords: Adsorption, Adsorption Model, Binding, Cations, Cu2+, Fibers, Filtration, Keratin, Keratose, Silk Fibroin Blend, Kinetic, Kinetic Model, Membrane, Nanofibres, pH, Polymer, Pseudo Second Order, Water, Wool

# Title: European Psychiatry

Full Journal Title: [European Psychiatry](http://www.sciencedirect.com/science?_ob=PublicationURL&_cdi=6137&_pubType=J&_auth=y&_acct=C000053193&_version=1&_urlVersion=0&_userid=1495547&md5=7b41ef74e268037875c8d00585a29e78); [European Psychiatry](http://web.ebscohost.com.ludwig.lub.lu.se/ehost/detail?vid=1&hid=111&sid=dd3b7df9-cd8a-4ce3-9436-e7ca50156050%40sessionmgr104&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&jid=JEJ); [European Psychiatry](http://www.sciencedirect.com.ludwig.lub.lu.se/science/journal/09249338)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Lopez-Munoz, F., Quintero-Gutierrez, F.J., Garcia-Garcia, P. and Alamo, C. (2007), ADHD bibliometric study over the last 25 years (i): Analysis of the production and dispersion of the scientific literature. *European Psychiatry*, **22** (S1), S254.

Full Text: [2007\Eur Psy22, S254.pdf](2007/Eur%20Psy22,%20S254.pdf)

Abstract: In the last years, attention-deficit/hyperactivity disorder (ADHD) is considered an emergent pathological entity. For this reason, a bibliometric analysis regarding scientific publications related to ADHD and its pharmacological treatment has been considered out, as well as its evolution during 1980-2005 period.

Using the EMBASE and MEDLINE database, we selected those documents whose title included the descriptors attention deficit hyperactivity disorder, attention deficit disorder, ADHD y ADD.

A total of 5269 original documents were obtained, and 2325 of these documents are corresponding to some aspects about drugs therapy. As bibliometric indicators of the production and dispersion, Price’s and Bradord’s Laws, were applied, respectively. Our data confirm the Price’ Law since scientific production about ADHD have an exponential growth (correlation coefficient r = 0.9859, vs. r = 0.9011 after a linear adjustment), without to estimate a saturation point. The more studied drugs are methylphenidate (1251 documents), mixed amphetamine salts (250), atomoxetine (204) and dexamphetamine (143). The division into Bradford’s areas shows a central nucleus occupied by Journal of the American Academy of Child and Adolescent Psychiatry (500 articles) exclusively. Other papers are distributed into 10 areas with a mean of 505.4 documents. A total of 886 different journals were used. The highest participation index (PaI) corresponds to Journal of Attention Disorders (PaI = 64.96). The more frequently used support journals have a high impact factors (IF) (12 of the 20 first have a IF>2)

Keywords: ADHD, Bibliometric, Bibliometric Study, Dispersion, Production

? Lopez-Munoz, F., Quintero-Gutierrez, F.J., Garcia-Garcia, P. and Alamo, C. (2007), ADHD bibliometric study over the last 25 years (II): Correlation with social-health parameters. *European Psychiatry*, **22** (S1), S254-S255.

Full Text: [2007\Eur Psy22, S255.pdf](2007/Eur%20Psy22,%20S255.pdf)

Abstract: In the last years, attention deficit hyperactivity disorder (ADHD) is considered an emergent pathological entity. For this reason, a bibliometric analysis regarding scientific publications related to ADHD and its pharmacological treatment has been considered out, as well as its evolution during 1980-2005 period.

Using the EMBASE and MEDLINE database, we selected those documents whose title included the descriptors attention deficit hyperactivity disorder, attention deficit disorder, ADHD y ADD, and that included the country of origin of the work. Altogether, 4423 original documents were obtained. In this social-health analysis, the national participation index (PaI) into global scientific production about ADHD was calculated. We have correlated it with global PaI in Biomedicine and Health Sciences, with the PaI in the Psychiatry discipline and with Social-Health index of the main productive countries in this field, like per capita health expenditure, number of physicians or per capita gross domestic product.

United States is the most productive country (participation index, PaI = 44.2), followed, at a long distance, by Canada (PaI = 6.14), United Kingdom (PaI = 5.07) and Germany (PaI = 4.33). Of the most productive in Health Sciences, only 4 countries exceed their own PaI in the Psychiatry field (Brazil, China, Spain, and USA). Correlation between PaI and per capita health expenditure offers a similar distribution to productivity ranking, except to China, Brazil and Turkey. On the contrary, correlation between PaI and total number of physicians in each country finds in better position Canada, Australia, USA and Israel.

Keywords: ADHD, Bibliometric, Bibliometric Study, Correlation, Parameters

? Garcia-Garcia, P., Lopez-Munoz, F., Rubio, G. and Alamo, C. (2007), Bibliometric analysis about the diagnostic criteria used in psychiatry (1980-2005). *European Psychiatry*, **22** (S1), S320.

Full Text: [2007\Eur Psy22, S320.pdf](2007/Eur%20Psy22,%20S320.pdf)

Abstract: The present versions of Diagnostic and Statistical Manual of Mental Disorders (DSM) and International Classification of Diseases (ICD) is being revised and their update will be published in a close future. In this sense, our purpose was to know the use of diagnostic criteria, in the Psychiatry area, since a bibliometric perspective.

The material studied was selected using databases (EMBASE & MEDLINE) during 1980-2005 period. Those documents that include the descriptors DSM\*, ICD\*, diagnostic criteria, Psychiat\*, drug\* were selected. We applied some bibliometric rules as Price’s Law of increasing in scientific literature.

A total of 11916 (DSM), 2019 (ICD), 30 (Chinese Classification of Mental Disorder), 5 (Cuban Glossary of Psychiatry and Latin American Guide for Psychiatry) documents were obtained in Medline database. Our results show nonfulfilment of Price’s Law because production on DSM or ICD does not grow exponential (yDSM = 54.576e0.1255x; rDSM = 0.95; yICD = 4.2643e0.1616x; rICD = 0.93), after linear adjustment (yDSM = 35.381x-50.295; rDSM = 0.98; y = 7.7221x-34.931; rICD = 0.98). Journals of American and European associations with the highest IF were selected from EMBASE database: American Journal of Psychiatry (IF = 8.286; PaIDSM = 12.39; PaIICD = 0.58) and British Journal of Psychiatry (IF = 4.956; PaIDSM = 5.62; PaIICD = 1.88).

During last years, the uses of diagnostic criteria (DSM or ICD) have increased in scientific literature. Nevertheless, documents that use other classifications are rather little.

Keywords: Analysis, Diagnostic Criteria, Psychiatry

? Garcia-Garcia, P., Lopez-Munoz, F., Rubio, G. and Alamo, C. (2008), Phytotherapy and psychiatry: A bibliometric study during the period 1986-2006. *European Psychiatry*, **23** (S2), S393.

Full Text: [2008\Eur Psy23, S393.pdf](2008/Eur%20Psy23,%20S393.pdf)

Abstract: Objectives: In different areas of Therapy, included Psychiatry, herbal medicine has had an increasing interest during the last years. Plants are traditional uses, but only a few have been approved therapeutically. However, we do not know any bibliometric analysis about herbs that are used in Psychiatry.

Methods: We have conducted a bibliometric study regarding scientific publications related to phytotherapy in the Psychiatry area during 1986-2006 period. Using the platform Embase.com (Elservier, Amsterdam), including EMBASE and MEDLINE database, we selected those documents whose included the descriptors plant, herb, phytotherap, and psychiatr (with all diagnostic criteria). Plants’ indications had been selected according to PDR for Herbal Medicines. As bibliometric indicator of the production, Price’s Law was applied.

Results: A total of 21.409 original documents were obtained. Our data confirm a fulfilment of the Price’ Law related to scientific production about medicinal plants in Psychiatry. We had observed it after carring out a lineal adjustment (y=135,08x-466,38 r=0.92) an another adjustment exponential curve (y=132,26e0.1497x; r=0.99). The plants more mentioned in the psychiatric literature have been St. John’s Wort (Hypericum perforatum; n=937) and Ginkgo (Ginkgo biloba; n=694). The countries with more percentage of documents were the Unites States (29,44%), Germany (9,41%) and Japan (8,75%), and the country with highest Index of Participation (number of documents per country / number of documents in our repertory) was India (IPa= 0,935) and China (IPa=0,721).

Conclusion: Productivity medicinal plants in the Psychiatry area increased during the period 1986-2006. Nevertheless, documents about therapeutic herbs in this field are rather little.

Keywords: Bibliometric, Bibliometric Study, Psychiatry

? Thorberg, F.A., Young, R.M., Sullivan, K.A. and Lyvers, M. (2011), Parental bonding and alexithymia: A meta-analysis. *European Psychiatry*, **26** (3), 187-193.

Full Text: 2011\Eur Psy26, 187.pdf

Abstract: Aim: The primary purpose of this meta-analysis was to explore, clarify and report the strength of the relationship between alexithymia, as measured by the Toronto Alexithymia Scale (TAS-20), and parenting style as measured by the Parental Bonding Instrument (FBI). Methods: Web of Science, PsycInfo, PUBMED and ProQuest: Dissertations and Theses searches were undertaken, yielding nine samples with sufficient data to be included in the meta-analysis. Results: Evidence indicated moderate to strong relationships between maternal care and alexithymia, and between maternal care and two of the three TAS-20 alexithymia facets (Difficulties Describing Feelings and Difficulties Identifying Feelings, but not Externally Oriented Thinking). Moderate relationships were observed for both maternal- and paternal-overprotection and alexithymia respectively, and for overprotection (both maternal and paternal) and Difficulties Describing Feelings. Conclusion: This study is the first meta-analysis of the relationship between parenting styles and alexithymia, and findings confirm an especially strong association between maternal care and key elements of alexithymia. This review highlights the issues that still remain to be addressed in exploring the link between parenting style and alexithymia. (C) 2010 Elsevier Masson SAS. All rights reserved.

Keywords: Affect Dysregulation, Alexithymia, Bonding, College-Students, Dissertations, Eating-Disorders, Factorial Validity, Heterogeneity, Meta-Analysis, Methods, Mothers Low Care, Parental Bonding, Parenting, Parenting Style, Primary, Publication, Pubmed, Questionnaire, Reliability, Review, Scale, Science, Systematic Reviews, Web of Science

# Title: European Psychologist

Full Journal Title: [European Psychologist](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=7214&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=099fe5686e6529e2a807adb063e23d03); [European Psychologist](http://psycnet.apa.org.ludwig.lub.lu.se/journals/epp/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

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Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Beck, D. and Diehl, M. (1997), Advances in small group research: Contributions from the German-speaking countries between 1984 and 1995. *European Psychologist*, **2** (4), 368-376.

Full Text: [1997\Eur Psy2, 368.pdf](1997/Eur%20Psy2,%20368.pdf)

? Carpintero, H. and Herrero, F. (2002), Early applied psychology: The early days of the IAAP. *European Psychologist*, **7** (1), 39-52.

Full Text: [2002\Eur Psy7, 39.pdf](2002/Eur%20Psy7,%2039.pdf)

Abstract: This study presents an approach to the origins of applied psychology, with consideration of the social and cultural context surrounding the development of science in Europe from the end of the 19th century. The second part provides quantitative information on the contents of applied psychology in its early history by looking at the evolution of participation, countries, authors, and subjects at the International Congresses of Applied Psychology from 1921 to 1958. This is done by applying bibliometric analysis objective methodology on the indexes and proceedings volumes.

? David, D., Moore, M. and Domuta, A. (2002), Romanian psychology on the international psychological scene: A preliminary critical and empirical appraisal. *European Psychologist*, **7** (2), 153-160.

Full Text: [2002\Eur Psy7, 153.pdf](2002/Eur%20Psy7,%20153.pdf)

Abstract: This study directly evaluates the visibility and the impact of Romanian academic psychology on the international scene using bibliometric indicators from the PsychoINFO, the MEDLINE, and the Institute for Scientific Information (ISI). It is also intended to use this evaluation of its international impact as an indirect estimate of the quality of Romanian academic psychology and to allow a consideration of future possible directions in its development. Such information would be useful for Romanian psychology programs in making future developmental policy and would further also be informative for our international colleagues in choosing Romanian partners for various projects and for the international institutions for a better allocation of the international psychological resources.

The preliminary conclusion is that although Romanian psychology is visible––an important point, considering the obstacles during the communist period––its products (i.e., publications) are still less competitive and play a minor role in international psychology. A supplementary analysis identifies the major players in Romanian academic psychology and in clinical psychology.

Keywords: Romanian Psychology, International Visibility, International Impact

? Krampen, G. and Wahl, H.W. (2003), Geropsychology and psychology in the last quarter of the 20th century - Bibliometrical results for the German-speaking versus Anglo-American research community. *European Psychologist*, **8** (2), 87-91.

Full Text: [2003\Eur Psy8, 87.pdf](2003/Eur%20Psy8,%2087.pdf)

Abstract: This paper presents bibliometrical results on the development of gerontopsychology in the last quarter of the 20th century. Analyses are based on the psychology literature documented in PsycINFO, covering mainly publications from the Anglo-American region, and PSYNDEX, covering publications from the German-speaking countries, for the years 1977 to 2000. Results show that both literature bodies on gerontopsychology have steadily grown, in absolute terms, since the beginning of the last quarter of the 20th century. The geropsychology literature in the German-speaking countries has grown faster than the Anglo-American literature. In terms of a relative frequency view, the findings support the notion that geropsychology has found a clear and stable position within psychology as a whole in both research communities, contributing 1-3% to the overall psychology literature and 8-15% (PsycINFO) respectively 30-50% (PSYNDEX) to the overall developmental psychology literature since 1978.

Keywords: Bibliometrical Analysis, Brief-History, Countries, Development, Developmental Psychology, German-Anglo-American Comparison, Gerontopsychology, History of Psychology, Literature, Psycinfo, Publications, Research

# Title: European Radiology

Full Journal Title: [European Radiology](http://www.springerlink.com/app/home/journal.asp?wasp=6ngnunquxpdcc2nhxnby&referrer=parent&backto=linkingpublicationresults,1:111050,1)

ISO Abbreviated Title: Eur. Radiol.

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Language: English

Publisher: Springer Verlag

Publisher Address: 175 Fifth Ave, New York, NY 10010

Subject Categories:

Radiology, Nuclear Medicine & Medical Imaging: Impact Factor

Hundt, W., Braunschweig, R. and Reiser, M. (1999), Evaluation of spiral CT in staging of colon and rectum carcinoma. *European Radiology*, **9** (1), 78-84.

Full Tex: [E\Eur Rad9, 78.pdf](E/Eur%20Rad9,%2078.pdf)

Abstract: The purpose of our study was to evaluate the capability of a subsecond spiral-CT scanner using two contrast medium phases in staging of colorectal cancer. In our study we included 37 patients with proven rectum or colon carcinoma. Spiral CT was performed following tap-water enema of the colon in the arterial and venous phases of contrast medium enhancement. Our results were compared with the findings of pathological examination after surgery. The tumor’s size and extension were: evaluated in the arterial and venous phases, the lymph nodes in the venous phase of the CT scan. The tumor was in the rectum (n = 14), sigma (n = 11), descending colon (n = 6), and cecum (n = 6). Two-phase spiral CT had a sensitivity of 97.2 % in the arterial phase and 89.1 % in the venous phase in detecting the carcinoma. The staging results were in the arterial phase in 30 of 37 cases (81.0%) and in the venous phase in 24 of 37 cases (64.8 %) according to pathology. In 27 of 32 patients (84.3 %) lymph nodes Merl detected. The correct classification of the N-stage was possible in 23 of 34 cases (67.6 %). The combined use of arterial and venous phases in staging of colorectal cancer can improve the T-and N-stage classification in comparison with using only one contrast medium phase. The arterial phase is superior compared with the venous phase for Local tumor staging and the venous phase is used for lymph node assessment.

Keywords: Colorectal Cancer, Neoplasms, Abdomen, Neoplasm Staging, Diagnostic-Oncology-Group, Computed-Tomography, Colorectal-Carcinoma, Cancer, Water, Tumors

? Miguel, A. and Marti-Bonmati, L. (2002), Self-citation: comparison between Radiologia, *European Radiology* and *Radiology* for 1997-1998. *European Radiology*, **12** (1), 248-252.

Full Tex: [2002\Eur Rad12, 248.pdf](2002/Eur%20Rad12,%20248.pdf)

Keywords: Database Medline, Impact Factor, Impact Factor, Journals, Journals, Self-Citation

Mela, G.S., Martinoli, C., Poggi, E. and Derchi, L.E. (2003), Radiological research in Europe: A bibliometric study. *European Radiology*, **13** (4), 657-662.

Full Tex: [E\Eur Rad13, 657.pdf](E/Eur%20Rad13,%20657.pdf)

Abstract: We performed a bibliometric search to evaluate number and scientific “weight” of papers written by European radiologists, as compared with colleagues from other countries, to measure the contribution of European researchers to radiology journals, and to correlate bibliometric parameters with some socio-economic factors of the different European nations. We considered all peer-reviewed articles published by radiologists in biomedical journals quoted by ISI over the 1995-2000 period. To identify authors as radiologists, the string “radiol” had to appear in the address of the corresponding author, and his country was considered as the country of origin of the paper. The definition of Europe included the 15 countries of the European Union, plus Norway and Switzerland. The scientific “weight” of the paper was assumed to be the impact factor of the journal of the publication in that given year. Then, we considered the annual indexes number of papers/population and number of papers/Gross Domestic Product (GDP) in each country. Data were retrieved from the Eurostat annual statistic reviews. From these bases, we obtained a comparison of the scientific production among European radiologists, those from the U.S. and those from the rest of the world. European radiological research is responsible of almost 40% of the world scientific production in our field, and Germany, UK and France are the leading publishers in Europe. An increase of the number of papers written by European radiologists was noted in the 1995-2000 period, whereas the production from the U.S. had a slight decrease. The mean concentration indexes papers/inhabitants and papers/GDP were significantly lower in Europe than in the U.S., even if some small European countries had higher values than the U.S. As a mean, European research received a lower impact factor than that from the U.S. The assessment of research output has progressively developed as an important issue for the scientific research community. Although not flawless, and often criticized for a variety of reasons, citation analysis is a commonly used technique in this field, is a frequent means to “weight” the scientific production of researchers and is one of the criteria used to assign research grants. Our study shows that European radiology is growing and its production is increasing over time, thus indicating strong commitment to research from European radiologists, however, European radiological research has not yet reached leadership in the literature, and mean indexes addressing the level of resources allocated to research are lower in Europe than in the U.S. This latter point has notable exceptions, but indicates inadequacy of funding, at least in some nations, and in Europe as a whole. The development of research programs within the framework of the European Union specifically aimed to radiology could lead to further advancement of our discipline.

Keywords: European Radiology, Bibliometry, “Impact Factor”, Union

Notes: highly cited

? Achenbach, S., Becker, C., Kopp, A. and Ohnesorge, B.M. (2006), First performance evaluation of a dual-source CT (DSCT) system. *European Radiology*, **16** (2), 256-268.

Full Tex: [2006\Eur Rad16, 256.pdf](2006/Eur%20Rad16,%20256.pdf)

Abstract: We present a performance evaluation of a recently introduced dual-source computed tomography (DSCT) system equipped with two X-ray tubes and two corresponding detectors, mounted onto the rotating gantry with an angular offset of 90 degrees. We introduce the system concept and derive its consequences and potential benefits for echocardiograph (ECG)-controlled cardiac CT and for general radiology applications. We evaluate both temporal and spatial resolution by means of phantom scans. We present first patient scans to illustrate the performance of DSCT for ECG-gated cardiac imaging, and we demonstrate first results using a dual-energy acquisition mode. Using ECG-gated single-segment reconstruction, the DSCT system provides 83 ms temporal resolution independent of the patient’s heart rate for coronary CT angiography (CTA) and evaluation of basic functional parameters. With dual-segment reconstruction, the mean temporal resolution is 60 ms (minimum temporal resolution 42 ms) for advanced functional evaluation. The z-flying focal spot technique implemented in the evaluated DSCT system allows 0.4 mm cylinders to be resolved at all heart rates. First clinical experience shows a considerably increased robustness for the imaging of patients with high heart rates. As a potential application of the dual-energy acquisition mode, the automatic separation of bones and iodine-filled vessels is demonstrated.

Keywords: Evaluation, Heart Rate, Imaging, Robustness

# Title: European Respiratory Journal

Full Journal Title: [European Respiratory Journal](http://www.ingentaconnect.com/content/ers/erj;jsessionid=5r5dr0q7o0q9g.victoria); [European Respiratory Journal](http://erj.ersjournals.com/)

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Language: English

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Publisher Address: 35 Norre Sogade, PO Box 2148, DK-1016 Copenhagen, Denmark

Subject Categories:

Respiratory System: Impact Factor 2.989, / (2001)

? Dales, R.E., Schweitzer, I., Toogood, J.H., Drouin, M., Yang, W., Dolovich, J. and Boulet, J. (1996), Respiratory infections and the autumn increase in asthma morbidity. *European Respiratory Journal*, **9** (1), 72-77.

Full Text: [E\Eur Res J9, 72.pdf](E/Eur%20Res%20J9,%2072.pdf)

Abstract: Unexplained autumn increases in hospital admissions for asthma have been reported in many countries, including the United States, Canada, England and Wales.

To investigate the role of infection, the association was tested between hospital admissions for asthma and respiratory infections among preschool children in Metropolitan Toronto, Canada during the period 1981 to 1989, The seasonal pattern in overall hospital utilization was assessed by admissions for nonrespiratory diseases, Time series analysis was used to remove potentially confounding temporal trends and the influence of correlated errors. A fourfold increase in asthma admissions occurred between July and October unaccompanied by similar increases in nonrespiratory admissions, Admissions began increasing during the third week of August, peaked during the third week in September and slowly decreased during November and December, After adjusting for serial correlation, trends, climate, ambient air pollution and aeroallergens, the seasonal pattern of respiratory infection explained 14% of the variance in asthma admissions. Based on seasonal patterns, respiratory infection is the major identifiable risk factor for the large autumnal increase in asthma admissions.

García-Río, F., Serrano, S., Dorgham, A., Alvarez-Sala, R., Ruiz Peña, A., Pino, J.M., Alvarez-Sala, J.L. and Villamor, J. (2001), A bibliometric evaluation of European Union research of the respiratory system from 1987-1998. *European Respiratory Journal*, **17** (6), 1175-1180.

Full Text: [E\Eur Res J17, 1175.pdf](E/Eur%20Res%20J17,%201175.pdf)

Abstract: This study analyses the evolution of the bibliometric indicators of productivity and repercussion of European Union (EU) research into the respiratory system during the period from 1987-1998, describing the geographical distribution.

Using MedLine, a selection was made of those articles by EU authors published between 1987-1998 in 38 respiratory system journals (classification from the Institute for Scientific Information), The journals, country of origin, number of articles and the relation to socioeconomic data, productivity index,, visibility index, expected impact factor (EIF) and relative impact factor (RIF) were all analysed.

The number of EU publications in respiratory system journals experienced an exponential increase, going from 606 articles (14.3% of world production) in 1987, to 2,325 (33.2%) in 1998, During this same period, the EIF increased from 1,258 to 2,111, The greatest gross productivities were those of the UK, France, Italy and Germany, although when corrected for number of inhabitants, Sweden, the Netherlands, Belgium and Denmark headed the list. The countries with the greatest mean EIF were the Netherlands, the UK, Spain and Belgium.

In conclusion, productivity and repercussions of European Union research of the respiratory system experienced an important increase during this period.

Keywords: Bibliometry, Respiratory Scientific Information, Statistics, Science-Citation-Index, Spanish Scientific Production, Biomedicine, Indicators, Journals, Publications, Nations, Care

? Woodhead, M., Ewig, S. and and Torres, A. (2003), Severe acute respiratory syndrome (SARS). *European Respiratory Journal*, **21** (5), 739-740.

Full Text: [E\Eur Res J21, 739.pdf](E/Eur%20Res%20J21,%20739.pdf)

Keywords: Clinical-Features, Disease, Virus

Notes: highly cited

? Celli, B.R., MacNee, W., Agusti, A., Anzueto, A., Berg, B., Buist, A.S., Calverley, P.M.A., Chavannes, N., Dillard, T., Fahy, B., Fein, A., Heffner, J., Lareau, S., Meek, P., Martinez, F., McNicholas, W., Muris, J., Austegard, E., Pauwels, R., Rennard, S., Rossi, A., Siafakas, N., Tiep, B., Vestbo, J., Wouters, E. and ZuWallack, R. (2004), Standards for the diagnosis and treatment of patients with COPD: A summary of the ATS/ERS position paper. *European Respiratory Journal*, **23** (6), 932-946.

Full Text: [2004\Eur Res J23, 932.pdf](2004/Eur%20Res%20J23,%20932.pdf)

Keywords: Obstructive Pulmonary-Disease, Randomized Controlled-Trial, Term Oxygen-Therapy, Acute Respiratory-Failure, Volume-Reduction Surgery, Quality-of-Life, Noninvasive Ventilation, Airway-Obstruction, Chronic-Bronchitis, Dynamic Hyperinflation

# Title: European Review of Agricultural Economics

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Subject Categories:

Agricultural Economics & Policy: Impact Factor 0.472, 3/8 (2000)

Mueller, R.A.E. and Sumner, D.A. (1999), Output counts: Comparing the published contributions by agricultural economists across countries. *European Review of Agricultural Economics*, **26** (4), 533-548.

Full Text: [E\Eur Rev Agr Eco26, 533.pdf](E/Eur%20Rev%20Agr%20Eco26,%20533.pdf)

Abstract: Agricultural economics research is an international endeavour that benefits from the free exchange of knowledge. Using data from the Social Science Citation Index (SSCI) we compare for the period 1987-1997 the published contributions by agricultural economics professors from universities in Germany, the Netherlands, the UK and the US, and we measure citations. There are considerable differences in the contributions pet capita to the international journal literature and in citations received. Germany has contributed much less per capita than the other countries and its agricultural economists have received fewer citations. The percentage distributions for articles and citations are remarkably similar across countries.

Keywords: Bibliometry, Agricultural Economics, International Comparison, Journals, Europe

# Title: European Spine Journal

Full Journal Title: [European Spine Journal](http://www.springerlink.com/(0bikne451bouzr55s0sr0255)/app/home/journal.asp?referrer=backto&backto=linkingpublicationresults,1:101557,1;&absoluteposition=4#A4)

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Language:

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Subject Categories:

: Impact Factor

Gunzburg, R., Szpalski, M. and Aebi, M. (2002), The impact factor: publish, be cited or perish..... *European Spine Journal*, **11** (1), S1.

Full Text: [E\Eur Spi J11, S1.pdf](E/Eur%20Spi%20J11,%20S1.pdf)

? Benoist, M. (2006), The Michel Benoist and Robert Mulholland yearly *European Spine Journal* review - A survey of the “medical” articles in the *European Spine Journal*, 2005. *European Spine Journal*, **15** (1), 2-7.

Full Text: [2006\Eur Spi J15, 2.pdf](2006/Eur%20Spi%20J15,%202.pdf)

Keywords: Survey

? Mulholland, R.C. (2006), The Michel Benoist and Robert Mulholland yearly *European Spine Journal* review - A survey of the “surgical and research” articles in the *European Spine Journal*, 2005. *European Spine Journal*, **15** (1), 8-15.

Full Text: [2006\Eur Spi J15, 8.pdf](2006/Eur%20Spi%20J15,%208.pdf)

Keywords: Survey

? Moojen, W.A., Arts, M.P., Bartels, R.H.M.A., Jacobs, W.C.H. and Peul, W.C. (2011), Effectiveness of interspinous implant surgery in patients with intermittent neurogenic claudication: A systematic review and meta-analysis. *European Spine Journal*, **20** (10), 1596-1606.

Full Text: [2011\Eur Spi J20, 1596.pdf](2011/Eur%20Spi%20J20,%201596.pdf)

Abstract: Despite an increasing implantation rate of interspinous process distraction (IPD) devices in the treatment of intermittent neurogenic claudication (INC), definitive evidence on the clinical effectiveness of implants is lacking. The main objective of this review was to perform a meta-analysis of all systematic reviews, randomized clinical trials and prospective cohort series to quantify the effectiveness of IPDs and to evaluate the potential side-effects. Data from all studies prospectively describing clinical results based on validated outcome scales and reporting complications of treatment of patients with INC with IPD placement. We searched MEDLINE, EMBASE, Web of Science, Cochrane (CENTRAL), CINAHL, Academic Search Premier, Science Direct up to July 2010. Studies describing patients with INC caused by lumbar stenosis, reporting complication rate and reporting based on validated outcome scores, were eligible. Studies with only instrumented IPD results were excluded. Eleven studies eligible studies were identified. Two independently RCTs and eight prospective cohorts were available. In total 563 patients were treated with IPDs. All studies showed improvement in validated outcome scores after 6 weeks and 1 year. Pooled data based on the Zurich Claudication Questionnaire of the RCTs were more in favor of IPD treatment compared with conservative treatment (pooled estimate 23.2, SD 18.5-27.8). Statistical heterogeneity after pooled data was low (I-squared 0.0, p = 0.930). Overall complication rate was 7%. As the evidence is relatively low and the costs are high, more thorough (cost-) effectiveness studies should be performed before worldwide implementation is introduced.

Keywords: Clinical Effectiveness, Clinical Trials, Clinically Important Difference, Cochrane, Complications, Costs, Degenerative, Degenerative Spondylolisthesis, Effectiveness, Embase, Implant, Implants, IPD, Low-Back-Pain, Lumbar Spinal, Lumbar Spinal Stenosis, Medline, Meta Analysis, Meta-Analysis, Of-The-Literature, Oswestry Disability Index, Outcome, Patients, Process Decompression System, Randomized Clinical Trials, Randomized-Trial, Review, Science, Side Effects, Stenosis, Surgery, Systematic, Systematic Review, Systematic Reviews, Treatment, Updated Method Guidelines, Web of Science, X-Stop Device

# Title: European Urology

Full Journal Title: [European Urology](http://www.sciencedirect.com/science/journal/03022838); [European Urology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=7228&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=c9d0a177a65df6f1503ba885563abdbc)

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Subject Categories:

: Impact Factor

Gambaro, G., Reis-Santos, J.M. and Rao, N. (2004), Nephrolithiasis: Why Doesn’t Our “Learning” Progress? *European Urology*, **45** (5), 547-556.

Full Text: [E\Eur Uro45, 547.pdf](E/Eur%20Uro45,%20547.pdf)

Abstract: *Objective:* Stone research is stagnant with minor clinical fall-out. We wonder whether this, in the ESWL era, depends only on ESWL and the consequent change in our clinical management habits, or is rather due to mistakes made by investigators. We feel that indeed we did and do make some: (1) the patients we are investigating may not be appropriate, and (2) we are missing to properly recognise disease heterogeneity.

*Conclusions:* From the public health side most likely we are not investigating the right patients, and we probably need to address the large part of the problem, i.e. the rarely relapsing stone formers demanding 80% of all urological interventions. Although there is a consensus that urolithiasis is very heterogeneous, this position is presently under reconsideration. It is necessary to investigate the single or “occasional” stone former, and go back to the epidemiology and clinics with multicentre, prospective studies. Being a multifactorial disease, we will need to evaluate as many aspects as possible contemporaneously in the same patient. It is also necessary to “revisit” the disease in an unbiased manner, because its relationship with relevant aspects could be different than previously thought due to our incomplete knowledge of its pathogenesis and pathophysiology.

Keywords: Nephrolithiasis, ESWL, Relapse, Natural History, Single Stone Former

? Novara, G., Galfano, A., Ficarra, V. and Artibani, W. (2006), Anticholinergic drugs in patients with bladder outlet obstruction and lower urinary tract symptoms: A systematic review. *European Urology*, **50** (4), 675-683.

Full Text: [2006\Eur Uro50, 675.pdf](2006/Eur%20Uro50,%20675.pdf)

Abstract: Objectives: To review the available evidence concerning the use of anticholinergic drugs, alone or in combination with alpha-blockers, in patients with lower urinary tract symptoms (LUTS) due to benign prostatic hyperplasia (BPH) and concomitant overactive bladder syndrome, to assess whether the currently available evidence suggests a role for antimuscarinic drugs in patients with BPH. Methods: A systematic review of the literature was performed using EMBASE, MEDLINE, and Web of Science through a complex search strategy including “free text” and “MeSH” protocols. Moreover, the Cochrane database of systematic review was browsed for records regarding BPH and the abstract books of the American Urological Association, European Association of Urology, and International Continence Society annual meetings from 2000 to 2005 were hand-searched for studies concerning the topic of the review. Results: From the literature search, we identified four randomised controlled trials (RCTs), two prospective case series, and a few congress abstracts. For methodologic issues, the best RCT was based on urodynamic data, but did not provide any clinical insight on the patients’ symptoms. The other papers were affected by significant methodologic or clinical drawbacks. Conclusion: The available data may be considered promising in terms of safety and efficacy. The evidence of the limited number of RCTs available, considering their methodologic or clinical shortcomings, is not sufficient to support the clinical use of combination therapy with alpha-blockers and anticholinergic drugs in patients with associated storage and voiding symptoms. Well-designed, large, double-blind, placebo- controlled, long-term RCTs are needed to assess the long-term safety and efficacy of antimuscarinic drugs, alone or in combination with alpha-blockers, in this category of patients. (c) 2006 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: Alpha-Blockers, Anticholinergic Drugs, Antimuscarinics, Antimuscarinics, Benign Prostatic Hyperplasia, Benign Prostatic Obstruction, Bladder Outlet Obstruction, Case Series, Cochrane, Combination Therapy, Combination Treatment, Darifenacin, Diagnosis, Doxazosin, Efficacy, Guidelines, Hyperplasia, Literature, Luts, Medline, Men, Methods, Overactive Bladder, Overactive Syndrome, Oxybutynin, Papers, Review, Safety, Science, Solifenacin, Strategy, Symptoms, Systematic, Systematic Review, Therapy, Tolterodine, Tolterodine, Tract, Urology, Web of Science

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Full Text: [2006\Eur Uro50, 903.pdf](2006/Eur%20Uro50,%20903.pdf)

Abstract: Objectives: To review evidence regarding perioperative predictors of incontinence after radical prostatectomy (RP), related anatomic and patient factors, and surgical techniques used to minimise incontinence. Methods: A search of the PUBMED, Cancerlit, Cochrane, and ISI Web of Science databases was performed for the key words prostatectomy, incontinence, and continence. Relevant articles were reviewed, summarised, and analysed. Results: Enhanced understanding of pelvic anatomy applied to surgical approaches has improved continence rates following RP; however, incontinence remains a potential adverse outcome. Evidence suggests that increasing patient body weight and prostate volume are not associated with continence outcomes, but increasing patient age may be predictive. Behavioural therapy may aid in early return to continence although the timing of therapy and benefit of biofeedback assistance are unclear. Various surgical techniques are used to improve continence, but no evidence overwhelmingly supports any specific technique. At best, evidence supports early return to continence with some techniques. No technique significantly increased margin positivity solely at the experimental anatomic site. Conclusions: Despite enhanced knowledge of anatomy and improved surgical approach, incontinence persists as a potential adverse outcome of RP. Urologists may not find an evidence-based rationalisation for any particular surgical technique due to the nature of surgical series, variability in the definition of incontinence, and individual surgical skills, preferences, and techniques. Giving careful consideration to the trial design can potentially improve the resulting level of evidence. (c) 2006 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: Anatomy, Bladder Neck Preservation, Bladder Neck Preservation, Body Weight, Cancer Control, Cochrane, Continence, Controlled-Trial, Databases, Decrease Postprostatectomy Incontinence, Incontinence, ISI, Knowledge, Membranous Urethra, Methods, Outcome, Outcomes, Positive Margins, Prostate Cancer, Puboprostatic Ligament, Puboprostatic Ligament, Radical Prostatectomy, Retropubic Prostatectomy, Review, Science, Surgical, Surgical Margins, Therapy, Urinary Continence, Urology, Variability, Web of Science

? Novara, G., Ficarra, V., Boscolo-Berto, R., Secco, S., Cavalleri, S. and Artibani, W. (2007), Tension-free midurethral slings in the treatment of female stress urinary incontinence: A systematic review and meta-analysis of Randomized controlled trials of effectiveness. *European Urology*, **52** (3), 663-679.

Full Text: [2007\Eur Uro52, 663.pdf](2007/Eur%20Uro52,%20663.pdf)

Abstract: Objectives: To evaluate the efficacy of tension-free vaginal tape (TVT) compared with other surgical treatments for stress urinary incontinence (SUI) and with other tension-free midurethral slings. Methods: A systematic review of the literature was performed in January 2007 using MEDLINE, EMBASE, and Web of Science. The searches used both “MeSH” and “free text” protocols. Meta-analysis was conducted using the Review Manager software 4.2 (Cochrane Collaboration). Results: Our search identified 37 randomized controlled trials. According to the Jadad score, the quality of the evaluated studies was limited in most papers. TVT outperformed Burch colposuspension in terms of postoperative continence rates (odds ratio [OR] from 0.38 to O.S9, according to the different end points), whereas success rates were similar after TVT and pubovaginal slings. Comparing TVT to the other retropubic tension-free midurethral vaginal slings, TVT was more efficacious than both intravaginal slingplasty (IVS; OR = 0.47; p = 0.007) and suprapubic arc (SPARC; OR from 0.53 to 0.56 according to the different evaluated end points). Indeed, the available data suggest similar efficacy for retropubic and trans-obturator tapes both in terms of subjective (OR = 0.98; p = 0.92) and objective (OR = 0.81; p = 0.34) cure rates. Conclusions: Our meta-analysis showed that TVT outperformed Burch colposuspension; efficacies of TVT and pubovaginal sling were similar. TVT was more efficacious than IVS and SPARC, whereas retropubic and trans-obturator tapes showed overlapping cure rates. The poor quality of most of the studies, both in terms of methodologic and clinical parameters, limits the strengths of the recommendations derived by the meta-analysis. (c) 2007 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: Burch Colposuspension, Burch Colposuspension, Cochrane, Collaboration, Continence, Effectiveness, Efficacy, Follow-Up, Free Vaginal Tape, Incontinence, Laparoscopic Colposuspension, Literature, Medline, Meta Analysis, Meta-Analysis, Methods, Monarc Pubovaginal Sling, Multicenter, Papers, Pelvic Organ Prolapse, Points, Pubovaginal Sling, Randomized Controlled Trials, Ratio, Retropubic, Review, Science, Software, Sparc, Stress, Stress Urinary Incontinence, Suburethral Slingplasty, Success, Surgical, Surgical-Treatment, Systematic, Systematic Review, Tension-Free Vaginal Tape, Tot, Trans-Obturator Tape, Transobturator, Transobturator Routes, Treatment, Tvt, Tvt-O, United-States, Urology, Web of Science

? Oelrich, B., Peters, R. and Jung, K. (2007), A bibliometric evaluation of publications in Urological journals among European Union countries between 2000-2005. *European Urology*, **52** (4), 1238-1248.

Full Text: [2007\Eur Uro52, 1238.pdf](2007/Eur%20Uro52,%201238.pdf)

Abstract: Objectives: To perform a bibliometric evaluation of publications from European Union (EU) countries in the international urological journals between 2000-2005 according to their national origin and in relation to international context. Methods: Articles except reviews, editorials, letters, and reports published during 2000-2005 in 19 international urological journals were screened using Web of Science database. The total number of publications and the cumulative impact factor were determined for the first 15 EU member states (EU15), the USA, and the world. These data were related for every country to the population size and the socio-economic indicators gross domestic product, gross domestic expenditure on research and experimental development, and expenditure on health care. Results: A total of 19.709 articles were published of which 6.878 (34.9%) came from the EU15 countries and 7.927 (40.2%) from the USA. About 15% of all papers from the EU15 countries were in collaboration with USA researchers. in the EU, the number of publications and the cumulative impact factor were dominated by United Kingdom, Germany, and Italy with about 52% of all papers and 50% of the cumulative impact factor. If adjusted for demographic and socio-economic factors the smaller countries Austria, Denmark, Finland, the Netherlands, and Sweden (alphabetical order) revealed a distinctly higher publication rate. Conclusions: This study based on bibliometric analyses in urological journals demonstrated a feasible solution to validate and compare the contribution of the various EU countries towards the urological research. (c) 2007 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: Anesthesia, Bibliometric, Bibliometrics, Collaboration, European Union, European Urology, Evaluation, Impact Factor, Impact Factor, Index, Italy, Japan Contribution, Publication Activity, Publications, Research Output, Science, United Kingdom

? Oelrich, B., Peters, R. and Jung, K. (2007), A Bibliometric evaluation of publications in Urological journals among European Union countries between 2000-2005. *European Urology*, **52** (4), 1238-1248.

Full Text: [2007\Eur Uro52, 1238.pdf](2007/Eur%20Uro52,%201238.pdf)

Abstract: Objectives: To perform a bibliometric evaluation of publications from European Union (EU) countries in the international urological journals between 2000-2005 according to their national origin and in relation to international context. Methods: Articles except reviews, editorials, letters, and reports published during 2000-2005 in 19 international urological journals were screened using Web of Science database. The total number of publications and the cumulative impact factor were determined for the first 15 EU member states (EU15), the USA, and the world. These data were related for every country to the population size and the socio-economic indicators gross domestic product, gross domestic expenditure on research and experimental development, and expenditure on health care. Results: A total of 19.709 articles were published of which 6.878 (34.9%) came from the EU15 countries and 7.927 (40.2%) from the USA. About 15% of all papers from the EU15 countries were in collaboration with USA researchers. in the EU, the number of publications and the cumulative impact factor were dominated by United Kingdom, Germany, and Italy with about 52% of all papers and 50% of the cumulative impact factor. If adjusted for demographic and socio-economic factors the smaller countries Austria, Denmark, Finland, the Netherlands, and Sweden (alphabetical order) revealed a distinctly higher publication rate. Conclusions: This study based on bibliometric analyses in urological journals demonstrated a feasible solution to validate and compare the contribution of the various EU countries towards the urological research. (c) 2007 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: Anesthesia, Articles, Bibliometric, Bibliometrics, Collaboration, Contribution, Development, European Urology, Evaluation, Germany, Health Care, Impact, Impact Factor, Impact Factor, Index, Italy, Japan Contribution, Journals, Methods, Papers, Publication, Publication Activity, Publications, Research, Research Output, Researchers, Science, Socioeconomic Factors, United Kingdom, Urology, Web of Science

? Novara, G., Galfano, A., Boscolo-Berto, R., Secco, S., Cavalleri, S., Ficarra, V. and Artibani, W. (2008), Complication rates of tension-free midurethral slings in the treatment of female stress urinary incontinence: A systematic review and meta-analysis of randomized controlled trials comparing tension-free midurethral tapes to other surgical procedures and different devices. *European Urology*, **53** (2), 288-309.

Full Text: [2008\Eur Uro53, 288.pdf](2008/Eur%20Uro53,%20288.pdf)

Abstract: Objectives: To evaluate the complication rates of tension-free midurethral slings compared with other surgical treatments for stress urinary incontinence, including other tension-free midurethral slings. Methods: A systematic review of the literature using MEDLINE, EMBASE, and Web of Science was performed in January 2007. Meta-analysis was conducted by using the Review Manager software 4.2. Results: Our search identified 33 randomized controlled trials reporting data on complication rates. Our meta-analysis showed that complication rates were similar after tension-free vaginal tape (TVT) and Burch colposuspension, with the exclusion of bladder perforation, which was more common after TVT (p = 0.0001), and reoperation rate, which was significantly higher after Burch colposuspension (p = 0.02). TVT and pubovaginal sling were followed by similar complication rates. With regards to the comparisons among retropubic tapes, TVT and intravaginal slingplasty had similar complication rates, whereas suprapubic arc sling (SPARC) was complicated by higher rates of voiding lower urinary tract symptoms (LUTS) (p = 0.02) and reoperations (p = 0.04). Comparing retropubic and transobturator tapes, the occurrence of bladder perforations (p = 0.007), pelvic haematoma (p = 0.03), and storage LUTS (p = 0.01) was significantly less common in patients treated by transobturator tapes. Conclusions: Tension-free slings were followed by lower risk of reoperation compared with Burch colposuspension, whereas pubovaginal sling and tension-free midurethral slings had similar complication rates. With regards to different tension-free tapes, voiding LUTS and reoperations were more common after SPARC, whereas bladder perforations, pelvic haematoma, and storage LUTS were less common after transobturator tapes. The quality of many evaluated studies was limited. (c) 2007 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: Burch Colposuspension, Burch Colposuspension, Embase, Follow-Up, Free Vaginal Tape, Incontinence, Laparoscopic Colposuspension, Literature, Luts, Management, Medline, Meta Analysis, Meta-Analysis, Methods, Multicenter, Pubovaginal Sling, Randomized Controlled Trials, Retropubic, Review, Risk, Science, Software, Sparc, Stress, Stress Urinary Incontinence, Suburethral Slingplasty, Surgical, Symptoms, Systematic, Systematic Review, Tension-Free Vaginal Tape, Tract, Transobturator, Transobturator Routes, Transobturator Tape, Treatment, TVT, Urology, Web of Science, Women

? Novara, G., Galfano, A., Secco, S., D’Elia, C., Cavalleri, S., Ficarra, V. and Artibani, W. (2008), A systematic review and meta-analysis of randomized controlled trials with antimuscarinic drugs for overactive bladder. *European Urology*, **54** (4), 740-764.

Full Text: [2008\Eur Uro54, 740.pdf](2008/Eur%20Uro54,%20740.pdf)

Abstract: Context: Anticholinergic drugs are commonly used in patients with overactive bladder (OAB) who do not achieve symptom relief and quality of life improvement with conservative management. Several drugs, with different doses, formulations, and routes of administration are currently available, making the choice quite difficult. Objective: To evaluate efficacy and safety of different doses, formulations, and route of administration of the available anticholinergic drugs. Evidence acquisition: A systematic review of the literature was performed in August 2007 using MEDLINE, EMBASE, and Web of Science. Efficacy (micturitions per 24 h, volume voided per micturition, urgency urinary incontinence episodes per 24 h, incontinence episodes per 24 h) and safety (mainly, adverse events and withdrawal rates) end points were evaluated in the randomized control trials (RCTs) assessing the role of anticholinergic drugs in non-neurogenic OAB. Meta-analysis of RCTs was conducted using the Review Manager software 4.2 (Cochrane Collaboration). Evidence synthesis: our systematic search identified 50 RCTs and three pooled analyses. Tolterodine immediate release (IR) had a more favorable profile of adverse events than oxybutynin IR. Regarding different dosages of IR formulations, dose escalation might yield some limited improvements in the efficacy but at the cost of significant increase in the rate of adverse events. In the comparisons between IR and extended-release (ER) formulations, the latter showed some advantages, both in terms of efficacy and safety. With regard to the route of administration, use if a transdermal route of administration does not provide significant advantage over an oral one. Conclusion: Many of the available RCTs have good methodological quality. ER formulations should be preferred to the IR ones. With regard to IR formulations, dose escalation might yield some improvements in the efficacy with significant increase in the AE. More clinical studies are needed to indicate which of the drugs should be used as first-, second-, or third-line treatment. (C) 2008 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: Anticholinergic Drugs, Bladder, Clinical-Efficacy, Cochrane, Collaboration, Control, Controlled-Release Oxybutynin, Darifenacin, Detrusor Overactivity, Detrusor Overactivity, Double-Blind, Drugs, Efficacy, Emepronium, Extended-Release, Fesoterodine, Incontinence, Literature, Management, Meta Analysis, Meta-Analysis, Muscarinic Receptor Antagonist, Overactive Bladder, Oxybutynin, Placebo-Controlled Trial, Points, Pooled Analysis, Profile, Propantheline, Propiverine, Quality of Life, Review, Safety, Science, Selective Receptor Antagonist, Software, Solifenacin, Systematic, Systematic Review, Tolterodine, Transdermal Oxybutynin, Treatment, Trospium, Urge Urinary-Incontinence, Urgency Frequency Syndrome, Urology, Web of Science

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Full Text: [2008\Eur Uro54, 1247.pdf](2008/Eur%20Uro54,%201247.pdf)

Abstract: Context: Interest in the use of simulators in urological skills training is on the increase. To ensure effective implementation of training models, an overview of the nature and validity of the available models is of the essence. Objective: To obtain an overview of training models and their validity by performing a qualitative systematic review of the literature. Evidence acquisition: Studies were identified through searches of PUBMED, the Cochrane Library, and Web of Science between January 1980 and April 2008 using two search strategies: “urology and (training or simulat\* or model)” and combinations of these terms with “prostate,” “kidney,” “bladder,” or “ureter.” Studies were included if they (1) described one or more training models, and/or (2) examined the validity of training models. Studies in undergraduate education and of training models for physical examination were excluded. Validation studies were scored according to Kirkpatrick and Oxford Centre for Evidence-Based Medicine (OCEBM) levels of evidence. Evidence synthesis: Forty-five articles (out of the initial list of 4753 retrieved articles, 0.9%) were included, describing 30 types of training models and 54 validation studies. The largest number of models has been described for ureterorenoscopy (nine types). Only three randomised controlled trials (RCTs), receiving a 1b OCEBM level of evidence score, were found. Studies investigating the impact of simulator training on performance in patients (criterion B validity) were scarce. The number of participants in experimental studies ranged from 7 to 136. Conclusions: Due to growing interest in training models in urology, it is increasingly urgent to determine which of these models are most valuable for postgraduate training. Because the validation studies published so far are few in number, have low evidence levels, and are composed of only a few RCTs, it is important that more randomised controlled validation studies including larger numbers of participants are performed. (C) 2008 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: Bench Model, Bladder, Cochrane, Education, Endoscopic Surgery, Flexible Cystoscopy, Impact, Interest, Kidney, Literature, Lower Urinary-Tract, Model, Overview, Percutaneous Nephrolithotomy, Prostate, Pubmed, Review, Science, Search Strategies, Skills, Surgical Simulation, Systematic, Systematic Review, Training, Transurethral Resection, Ureter, Ureteroscopy, Urology, Validation, Validity, Virtual-Reality Simulator, Web of Science

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Full Text: [2009\Eur Uro55, 1037.pdf](2009/Eur%20Uro55,%201037.pdf)

Abstract: Context: Despite the wide diffusion of laparoscopic radical prostatectomy (LRP) and robot-assisted laparoscopic radical prostatectomy (RALP), only few studies comparing the results of these techniques with the retropubic radical prostatectomy (RRP) are currently available. Objective: To evaluate the perioperative, functional, and oncologic results in the comparative studies evaluating RRP, LRP, and RALP. Evidence acquisition: A systematic review of the literature was performed in January 2008, searching MEDLINE, EMBASE, and Web of Science databases. A “free-text” protocol using the term radical prostatectomy was applied. Some 4000 records were retrieved from the MEDLINE database; 2265 records were retrieved from the EMBASE database;, and 4219 records were retrieved from the Web of Science database. Three of the authors reviewed the records to identify comparative studies. A cumulative ana ys s was conducted using Review Manager software v.4.2 (Cochrane Collaboration, Oxford, UK). Evidence synthesis: Thirty-seven comparative studies were identified in the literature search, including a single, randomised, controlled trial. With regard to the perioperative outcome, LRP and RALP were more time consuming than RRP, especially in the initial steps of the learning curve, but blood loss, transfusion rates, catheterisation time, hospitalisation duration, and complication rates all favoured LRP. With regard to the functional results, LRP and RRP showed similar continence and potency rates. Similarly, no significant differences were identified between LRP and RALP, while a single, nonrandomised, prospective study suggested advantages in terms of both continence and potency recovery after RALP, compared with RRP. With regard to the oncologic outcome, LRP and RALP were associated with positive surgical margin rates similar to those of RRP. Conclusions: The quality of the available comparative studies was not excellent. LRP and RALP are followed by significantly lower blood loss and transfusion rates, but the available data were not sufficient to prove the superiority of any surgical approach in terms of functional and oncologic outcomes. Further high-quality, prospective, multicentre, comparative studies are needed. (C) 2009 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: Authors, Blood, Cancer Control, Cochrane, Collaboration, Consecutive Series, Continence, Databases, Diffusion, Erectile Dysfunction, Functional, Laparoscopy, Learning, Literature, Outcome, Outcomes, Perioperative Morbidity, Positive Surgical Margins, Prostatectomy, Prostatic Neoplasms, Protocol, Quality-of-Life, Radical Prostatectomy, Retropubic, Review, Robotics, Science, Sexual Function, Single-Institution, Software, Surgical, Survival Rates, Systematic, Systematic Review, UK, Urinary Continence, Urinary Incontinence, Urology, Vattikuti-Institute Prostatectomy, Web of Science

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Full Text: [2009\Eur Uro56, 798.pdf](2009/Eur%20Uro56,%20798.pdf)

Abstract: Context: Incorporation of bipolar technology in transurethral resection (TUR) of the prostate (TURP) potentially offers advantages over monopolar TURP (M-TURP). Objective: To evaluate the evidence by a meta-analysis, based on randomized controlled trials (RCTs) comparing bipolar TURP (B-TURP) with M-TURP for benign prostatic obstruction. Primary end points included efficacy (maximum flow rate [Q(max)], International Prostate Symptom Score) and safety (adverse events). Secondary end points included operation time and duration of irrigation, catheterization, and hospitalization. Evidence acquisition: Based on a detailed, unrestricted strategy, the literature was searched up to February 19, 2009, using Medline, Embase, Science Citation Index, and the Cochrane Library to detect all relevant RCTs. Methodological quality assessment of the trials was based on the Dutch Cochrane Collaboration checklist. Meta-analysis was performed using Review Manager 5.0. Evidence synthesis: Sixteen RCTs (1406 patients) were included. Overall trial quality was low (eg, allocation concealment and blinding of outcome assessors were poorly reported). No clinically relevant differences in short-term (12-mo) efficacy were detected (Q(max): weighted mean difference [WMD]: 0.72 ml/s; 95% confidence interval [CI], 0.08-1.35; p = 0.03). Data on follow-up of >12 mo are scarce for B-TURP, precluding long-term efficacy evaluation. Treating 50 patients (95% CI, 33-111) and 20 patients (95% CI, 10100) with B-TURP results in one fewer case of TUR syndrome (risk difference [RD]: 2.0%; 95% CI, 0.9-3.0%; p = 0.01) and one fewer case of clot retention (RD: 5.0%; 95% CI, 1.0-10%; p = 0.03), respectively. Operation times, transfusion rates, retention rates after catheter removal, and urethral complications did not differ significantly. Irrigation and catheterization duration was significantly longer with M-TURP(WMD: 8.75 h; 95% CI, 6.8-10.7 and WMD: 21.77 h; 95% CI, 19.22-24.32; p < 0.00001, respectively). Inferences for hospitalization duration could not be made. PlasmaKinetic TURP showed an improved safety profile. Data on TUR in saline (TURis) are not yet mature to permit safe conclusions. Conclusions: No clinically relevant differences in short-term efficacy exist between the two techniques, but B-TURP is preferable due to a more favorable safety profile (lower TUR syndrome and clot retention rates) and shorter irrigation and catheterization duration. Well-designed multicentric/international RCTs with long-term follow- up and cost analysis are still needed. (C) 2009 European Association of Urology. Published by Elsevier B. V. All rights reserved.

Keywords: 1-Year Follow-Up, Benign Prostatic Hyperplasia, Bipolar, Conventional Resectoscope, Electrosurgery, Ex-Vivo, Hemostatic Properties, Hyperplasia, International, Management, Meta-Analysis, Plasmakinetic, Plasmakinetic Resection, Prostate, Randomized Controlled Trial, Review, Saline, Standard, Transurethral Resection of Prostate, TURP, Urinary-Tract Symptoms

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Full Text: [2010\Eur Uro58, 218.pdf](2010/Eur%20Uro58,%20218.pdf)

Abstract: Context: Burch colposuspension, pubovaginal sling, and midurethral retropubic tape (RT) and transobturator tape (TOT) have been the most popular surgical treatments for female stress urinary incontinence (SUI). Several randomized controlled trials (RCTs) have been published comparing the different techniques, with conflicting results. Objective: Our aim was to evaluate the efficacy, complication, and reoperation rates of midurethral tapes compared with other surgical treatments for female SUI. Evidence acquisition: A systematic review of the literature was performed using the MEDLINE, EMBASE, Scopus, Web of Science databases, and Cochrane Database of Systematic Reviews. Evidence synthesis: Thirty-nine RCTs were identified. Patients receiving midurethral tapes had significantly higher overall (odds ratio [OR]: 0.61; confidence interval [CI]: 0.46-0.82; p = 0.00009) and objective (OR: 0.38; CI: 0.25-0.57; p < 0.0001) cure rates than those receiving Burch colposuspension, although they had a higher risk of bladder perforations (OR: 4.94; CI: 2.09-11.68; p = 0.00003). Patients undergoing midurethral tapes and pubovaginal slings had similar cure rates, although the latter were slightly more likely to experience storage lower urinary tract symptoms (LUTS) (OR: 0.31; CI: 0.10-0.94; p = 0.04) and had a higher reoperation rate (OR: 0.31; CI: 0.12-0.82; p = 0.02). Patients treated with RT had slightly higher objective cure rates (OR: 0.8; CI: 0.65-0.99; p = 0.04) than those treated with TOT; however, subjective cure rates were similar, and patients treated with TOT had a much lower risk of bladder and vaginal perforations (OR: 2.5; CI: 1.75-3.57; p < 0.00001), hematoma (OR: 2.62; CI: 1.35-5.08; p = 0.005), and storage LUTS (OR: 1.35; CI: 1.05-1.72; p = 0.02). Meta-analysis demonstrated similar outcomes for TVT-O (University of Liege, Liege, Wallonia, Belgium) and Monarc (AMS, Minnetonka, MN, USA). Conclusions: Patients treated with RT experienced slightly higher continence rates than those treated with Burch colposuspension, but they faced a much higher risk of intraoperative complications. RT and pubovaginal slings were similarly effective, although patients with pubovaginal slings were more likely to experience storage LUTS. The use of RT was followed by objective cure rates slightly higher than TOT, but subjective cure rates were similar. TOT had a lower risk of bladder and vaginal perforations and storage LUTS than RT. The strength of these findings is limited by the heterogeneity of the outcome measures and the short length of follow-up. (C) 2010 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: Belgium, Burch Colposuspension, Cochrane, Comparing Tvt, Continence, Databases, Efficacy, Female, Follow-Up, Free Vaginal Tape, Incontinence, Laparoscopic Burch Colposuspension, Literature, Luts, Meta Analysis, Meta-Analysis, Multicenter, Outcome, Outcomes, Pubovaginal Sling, Randomized Controlled Trials, Randomized-Controlled-Trial, Ratio, Retropubic, Retropubic Vaginal Tape, Review, Risk, Science, Scopus, Stress, Stress Urinary Incontinence, Surgical, Symptoms, Systematic, Systematic Review, Tension-Free, Tension-Free Tape, Term-Follow-Up, Tot, Tract, Transobturator, Transobturator Tape, Transobturator Tape, TVT-O, University, Urology, Web of Science, Women

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Full Text: [2010\Eur Uro58, 498.pdf](2010/Eur%20Uro58,%20498.pdf)

Abstract: Context: Laparoscopic living-donor nephrectomy (LLDN) has achieved a permanent place in renal transplantation and in some centers has replaced open donor nephrectomy as the standard technique. Objective: To evaluate the published literature regarding the relative results and complications of open LLDN and the hybrid technique of hand-assisted LLDN. Evidence acquisition: A systematic review of the literature was performed, searching PUBMED and Web of Science. A “free text’’ protocol using the term living-donor nephrectomy was applied. Six hundred twenty-nine records were retrieved from the PUBMED database and 686 records were retrieved from the Web of Science database. Evidence synthesis: Fifty-seven comparative studies were identified in the literature search. The three techniques of open, laparoscopic, and hand-assisted laparoscopic donor nephrectomy were compared in terms of reported outcomes. With regard to the perioperative outcome parameters, laparoscopy was better than open surgery in terms of blood loss, analgesic requirements, and duration of hospital stay and convalescence. Postoperative graft function was not significantly different between the different forms of donor nephrectomy, although longer warm ischemia times are reported for laparoscopy. Conclusions: All three techniques of live-donor nephrectomy are standard of care. The laparoscopic techniques result in less postoperative pain and estimated blood loss with shorter hospital stay, while postoperative graft function is not inferior to that after open live-donor nephrectomy. (C) 2010 European Association of Urology. Published by Elsevier B. V. All rights reserved.

Keywords: Blood, Clinical-Trial, Complications, Cost-Effectiveness, Hospital, Indications, Ischemia, Kidney Donors, Laparoscopy, Late Graft Function, Literature, Living-Donor Nephrectomy, National-Survey, Outcome, Outcomes, Pain, Protocol, Pubmed, Quality-Of-Life, Randomized Controlled-Trial, Renal-Function, Review, Science, Single-Center Experience, Surgery, Systematic, Systematic Review, Transplant Centers, Urology, Web of Science

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Full Text: [2010\Eur Uro58, 687.pdf](2010/Eur%20Uro58,%20687.pdf)

Abstract: Context: Numerous predictive and prognostic tools have recently been developed for risk stratification of prostate cancer (PCa) patients who are candidates for or have been treated with radical prostatectomy (RP). Objective: To critically review the currently available predictive and prognostic tools for RP patients and to describe the criteria that should be applied in selecting the most accurate and appropriate tool for a given clinical scenario. Evidence acquisition: A review of the literature was performed using the MEDLINE, Scopus, and Web of Science databases. Relevant reports published between 1996 and January 2010 identified using the keywords prostate cancer, radical prostatectomy, predictive tools, predictive models, and nomograms were critically reviewed and summarised. Evidence synthesis: We identified 16 predictive and 22 prognostic validated tools that address a variety of end points related to RP. The majority of tools are prediction models, while a few consist of risk-stratification schemes. Regardless of their format, the tools can be distinguished as preoperative or postoperative. Preoperative tools focus on either predicting pathologic tumour characteristics or assessing the probability of biochemical recurrence (BCR) after RP. Postoperative tools focus on cancer control outcomes (BCR, metastatic progression, PCa-specific mortality [PCSM], overall mortality). Finally, a novel category of tools focuses on functional outcomes. Prediction tools have shown better performance in outcome prediction than the opinions of expert clinicians. The use of these tools in clinical decision-making provides more accurate and highly reproducible estimates of the outcome of interest. Efforts are still needed to improve the available tools’ accuracy and to provide more evidence to further justify their routine use in clinical practice. In addition, prediction tools should be externally validated in independent cohorts before they are applied to different patient populations. Conclusions: Predictive and prognostic tools represent valuable aids that are meant to consistently and accurately provide most evidence-based estimates of the end points of interest. More accurate, flexible, and easily accessible tools are needed to simplify the practical task of prediction. (C) 2010 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: 3-Dimensional Conformal Radiotherapy, Accuracy, Biochemical Recurrence, Cancer, Cancer-Specific Mortality, Control, Critical, Databases, Decision Making, Decision-Making, External Validation, Functional, Interest, Life-Expectancy, Literature, Lymph-Node Invasion, Mortality, Nomograms, Outcome, Outcomes, Points, Practice, Prediction, Prediction Tools, Pretreatment Nomogram, Prostate Cancer, Prostatectomy, Radiation-Therapy, Radical Prostatectomy, Recurrence, Review, Risk, Science, Scopus, Seminal-Vesicle Invasion, Updated Partin Tables, Urology, Web of Science

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Full Text: [2011\Eur Uro60, 291.pdf](2011/Eur%20Uro60,%20291.pdf)

Abstract: Context: The notion of insignificant prostate cancer (Ins-PCa) has progressively emerged in the past two decades. The clinical relevance of such a definition was based on the fact that low-grade, small-volume, and organ-confined prostate cancer (PCa) may be indolent and unlikely to progress to biologic significance in the absence of treatment. Objective: To review the definition of Ins-PCa, its incidence, and the clinical impact of Ins-PCa on the contemporary management of PCa. Evidence acquisition: A review of the literature was performed using the MEDLINE, Scopus, and Web of Science databases with no restriction on language up to September 2010. The literature search used the following terms: insignificant, indolent, minute, microfocal, minimal, low volume, low risk, and prostate cancer. Evidence synthesis: The most commonly used criteria to define Ins-PCa are based on the pathologic assessment of the radical prostatectomy specimen: (1) Gleason score <= 6 without Gleason pattern 4 or 5, (2) organ-confined disease, and (3) tumour volume < 0.5 cm(3). Several preoperative criteria and prognostication tools for predicting Ins-PCa have been suggested. Nomograms are best placed to estimate the risk of progression on an individualised basis, but a substantial proportion of men with a high probability of harbouring Ins-PCa are at risk for pathologic understaging and/or undergrading. Thus, there is an ongoing need for identifying novel and more accurate predictors of Ins-PCa to improve the distinction between insignificant versus significant disease and thus to promote the adequate management of PCa patients at low risk for progression. Conclusions: The exciting challenge of obtaining the pretreatment diagnostic tools that can really distinguish insignificant from significant PCa should be one of the main objectives of urologists in the following years to decrease the risk of overtreatment of Ins-PCa. (C) 2011 European Association of Urology. Published by Elsevier B. V. All rights reserved.

Keywords: Active Surveillance, Active Surveillance, Assessment, Biochemical Recurrence, Cancer, Clinical-Significance, Databases, Disease, Impact, Independent Predictor, Indolent, Insignificant, Literature, Management, Nomograms, Organ-Confined Disease, Prediction, Preoperative Prediction, Prognostic-Significance, Prostate, Prostate Cancer, Radical Prostatectomy, Review, Risk, Science, Scopus, Significant, Systematic Biopsies, Treatment, Tumor Volume, Tumour Volume, Urology, Web of Science

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Full Text: [2011\Eur Uro60, 435.pdf](2011/Eur%20Uro60,%20435.pdf)

Abstract: Context: For small renal masses (SRMs), partial nephrectomy (PN) represents the therapeutic standard of care. Laparoscopic cryoablation (LCA) could be regarded as an alternative to surgical excision in selected patients, if perioperative complication rates and oncologic results are comparable. Objective: To perform a cumulative analysis of observational studies regarding oncologic outcomes and perioperative complications of both procedures. Evidence acquisition: MEDLINE, EMBASE, and Web of Science searches were performed for clinically localized sporadic SRMs that were treated with PN or LCA. A total of 6785 lesions were analyzed for local and metastatic tumor progression and 10 906 procedures for perioperative complications. Evidence synthesis: Patients undergoing LCA were significantly older, mean tumor sizes were lower, and mean follow-up duration was shorter (each p < 0.001). Following LCAandPN, 8.5% and 1.9% developed local tumor progression, respectively (p < 0.001). In multivariable analysis, the relative risk for local tumor progression of LCA versus PN was 5.24-fold increased (p < 0.001); the risk of metastatic progression was similar. The overall complication rate was higher following PN (23.5% vs 17.0%; p < 0.001), especially the rate of major complications (19.2% vs 10.2%; p < 0.001). In multivariable analysis, the total risk for complications and major complications for PN versus LCA was 4.6-fold (p = 0.004) and 9.71-fold (p < 0.001) increased, respectively. Limitations of this analysis include follow-up and selection bias, and lack of standardization reporting complications and outcomes. Conclusions: Both PN and LCA are viable options for the management of SRMs. Compared with PN, LCA results in a higher risk of local tumor progression. The risk of perioperative complications appears to be lower following LCA; however, this difference is strongly influenced by selection bias, and thus limited conclusions can be made regarding true differences in complications. Therefore, PN is the gold standard for SRMs, but LCA may be indicated in selected patients with significant comorbidity. (C) 2011 European Association of Urology. Published by Elsevier B.V. All rights reserved.

Keywords: Ablation, Analysis, Bias, Cell Carcinoma, Comorbidity, Complications, Cryoablation, Cumulative Analysis, Follow-Up, Kidney Cancer, Management, Metaanalysis, Observational Studies, Outcomes, Partial Nephrectomy, Recurrence, Relative Risk, Renal, Review, Risk, Science, Selection Bias, Small Renal Mass, Small Renal Tumor, Surgical, Systematic, Systematic Review, Tumors, Urology, Web of Science

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Full Text: [2011\Eur Uro60, 1029.pdf](2011/Eur%20Uro60,%201029.pdf)

Abstract: Context: Numerous observational epidemiologic studies have evaluated the association between physical activity and prostate cancer (PCa); however, the existing results are inconsistent. Objective: To determine the association between physical activity and risk of PCa. Evidence acquisition: A systematic search was performed using the Medline, Embase, and Web of Science databases through 15 May 2011 to identify all English-language articles that examined the effect of physical activity on the risk of PCa. This meta-analysis was conducted according to the guidelines for the meta-analysis of observational studies in epidemiology. Evidence synthesis: This meta-analysis consisted of 88 294 cases from 19 eligible cohort studies and 24 eligible case-control studies. When data from both types of studies were combined, total physical activity (TPA) was significantly associated with a decreased risk of PCa (pooled relative risk [RR]: 0.90; 95% confidence interval [CI], 0.84-0.95). The pooled RR for occupational physical activity (OPA) and recreational physical activity (RPA) were 0.81 (95% CI, 0.73-0.91) and 0.95 (95% CI, 0.89-1.00), respectively. Notably, for TPA, we observed a significant PCa risk reduction for individuals between 20 and 45 yr of age (RR: 0.93; 95% CI, 0.89-0.97) and between 45 and 65 yr of age (RR: 0.91; 95% CI, 0.86-0.97) who performed activities but not for individuals <20 yr of age or >65 yr of age. Conclusions: There appears to be an inverse association between physical activity and PCa risk, albeit a small one. Given that increasing physical activity has numerous other health benefits, men should be encouraged to increase their physical activity in both occupational and recreational time to improve their overall health and potentially decrease their risk of PCa. (C) 2011 Published by Elsevier B. V. on behalf of European Association of Urology.

Keywords: Activities, Association, Cancer, Case-Control, Case-Control Studies, Cohort, Cohort Studies, Databases, Epidemiologic Studies, Epidemiology, Exercise, Follow-Up, Guidelines, Health Benefits, Immune Function, Life-Style Factors, Medline, Men, Meta Analysis, Meta-Analysis, Motor Activity, Observational, Observational Studies, Occupational, Physical Activity, Population, Prevention, Prostate, Prostate Cancer, Prostatic Neoplasms, Reduction, Relative Risk, Review, Risk, Risk Reduction, Science, Serum-Insulin, Synthesis, Systematic, Systematic Review, United-States, Urology, Web of Science

# Title: Evaluation & the Health Professions

Full Journal Title: [Evaluation & the Health Professions](http://ehp.sagepub.com/archive/)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Lee, W.L., Bausell, R.B. and Berman, B.M. (2001), The growth of health-related meta-analyses published from 1980 to 2000. *Evaluation & the Health Professions*, **24** (3), 327-335.

Full Text: [2001\Eva Hea Pro24, 327.pdf](2001/Eva%20Hea%20Pro24,%20327.pdf)

Abstract: A MEDLINE search was conducted to estimate trends in the growth of health-related meta-analyses published during the past two decades. Employing a more specific than sensitive search strategy, and not supplementing these results with known sources of published meta-analyses or manual search strategies, 3,025 probable meta-analyses were selected from the 5,128 citations identified. The data showed a definitive upward (and generally linear) trend across time with no evidence for this genre of research either leveling off or decreasing.

Keywords: Citations, Data, Evidence, Growth, MEDLINE, Research, Search Strategies, Search Strategy, Sources, Trend, Trends

# Title: Evaluation & Management

Full Journal Title: [Evaluation & Management](http://e29.cnki.net/KNS50/Navi/item.aspx?NaviID=1&BaseID=&NaviLink=%e8%af%84%e4%bb%b7%e4%b8%8e%e7%ae%a1%e7%90%86)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

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Subject Categories:

: Impact Factor

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Full Text: [2005\Eva Man3, 49.pdf](2005/Eva%20Man3,%2049.pdf)

Keywords: Bibliometric, Citation Analysis, Science Evaluation, Information Management

# Title: Evaluation and Program Planning

Full Journal Title: [Evaluation and Program Planning](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=5852&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=7641717d0148936ef12be12a86d66661)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Logsdon, J.M. and Rubin, C.B. (1988), Research evaluation activities of ten federal agencies. *Evaluation and Program Planning*, **11** (1), 1-11.

Full Text: [E\Eva Pro Pla11, 1.pdf](E/Eva%20Pro%20Pla11,%201.pdf)

Abstract: This article summarizes results of research into the postperformance research evaluation measures in use by the ten federal agencies that have the highest budgets for support of basic and applied research. Two classes of research evaluations are identified: (a) those intended as tools for the management of research programs and projects, and (b) those that demonstrate the payoffs from research to a broader constituency. Few innovative or unexpected research evaluation approaches were found. The most widely used evaluation technique is some form of peer review of research results. A few specific evaluations or evaluation approaches are of particular interest, namely:

* an elaborate, highly structured Peer Review Panel at the Department of Energy which reviews the results of basic energy sciences programs,
* work in bibliometric analysis sponsored by the National Institutes of Health,
* attempts to measure productivity and other impacts of research programs at the National Bureau of Standards,
* attempts to trace links between research and its utilization by the office of Naval Research, and
* a study prepared by the National Science Foundation that used a variety of measures to do postperformance evaluation of chemistry research supported by NSF.

# Title: Evaluation Review

Full Journal Title: [Evaluation Review](http://203.64.48.31:8888/cgi-bin/ej/client/browse.cgi?ccd=lqKgWo&sentry=1&id=2002-07-001908&JS=1)

ISO Abbreviated Title: Eval. Rev.

JCR Abbreviated Title: Evaluation Rev

ISSN: 0193-841X

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Journal Country/Territory: United States

Language: English

Publisher: Sage Publications Inc

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

Subject Categories:

Social Sciences, Interdisciplinary: Impact Factor 0.392, 27/55 (2001)

? Narin, F., Olivastro, D. and Stevens, K.A. (1994), Bibliometrics theory, practice and problems. *Evaluation Review*, **18** (1), 65-76.

Full Text: [1994\Eva Rev18, 65.pdf](1994/Eva%20Rev18,%2065.pdf)

Abstract: This article presents the theory behind modern evaluative bibliometric techniques at three levels Policy applications which characterizes the scientific and technological output of nations or regions, strategic analyses, which deals with articles and patents at the level of a university or company, and tactical analyses, which addresses questions concerning a single subject. The article explains the newer techniques that have been developed at each level, as well as the more important limitations.

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Full Text: [1994\Eva Rev18, 98.pdf](1994/Eva%20Rev18,%2098.pdf)

Abstract: This article presents basic principles and examples of spatial representations derived from the analysis of co-occurrence frequency data pertaining to bibliographic information elements, such as key words and citations in research publications and patents These bibliometric maps provide a means for communicating information on relational features of the science and technology (S&T) system-either for analytical or representational purposes. Characteristics of the main types of bibliometric maps are outlined and their potential for practical applications in S&T policy and research and development management are discussed An emphasis is placed on more recent developments, in particular bibliometric maps produced by the Cent e for Science and Technology Studies (CWTS) for depicting temporal changes in the S&T system Three empirical examples of such mops are presented with a focus an their application for impact assessment in both scientific as well as technological fields: (1) the emergence of new research topics in worldwide research on manufacturing technology, (2) changes in patterns of (inter)national collaboration within Dutch research on coal and coal products, and (3) the role of instruments in materials science.

Keywords: Assessment, Bibliometric, Citation, Citations, Collaboration, Combined Cocitation, Development, Emergence, Impact, Management, Networks, Publications, Research, Research and Development, Research Topics, Science, Science and Technology, System, Technology, Temporal, Word Analysis

Petrosino, A. (2000), Mediators and moderators in the evaluation of programs for children. Current practice and agenda for improvement. *Evaluation Review*, **24** (1), 47-72.

Full Text: [E\Eva Rev24, 47.pdf](E/Eva%20Rev24,%2047.pdf)

Abstract: The author examines the role of mediators and moderators in the evaluation of programs for children. The terms are defined and examples of each are presented. Using bibliometric analysis, the author examines how evaluators use mediators and moderators in treatment studies in education, juvenile justice, health care, child protection, and mental health. The use of mediators and moderators is sporadic and vague at best. An agenda for improvement is outlined that includes greater use of program theory and intensive case studies to find out why researchers in prevention and health promotion incorporate mediators and moderators more effectively in their evaluations.

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Full Text: [2009\Eva Rev33, 159.pdf](2009/Eva%20Rev33,%20159.pdf)

Abstract: The study of “scientific excellence” is taking on increasing importance in the development of research policies in many nations. However, scientific excellence is difficult to define because of its multidimensional and highly complex character. This work contributes to the state of the art by exploring an effective, simple, and inexpensive bibliometric methodology that further identifies “excellent” centers of research by beginning with the individual researchers affiliated with such centers. The study concentrates on public research organizations in Italy, analyzing 109 scientific categories of research in the “hard” sciences and 157 centers of excellence operating in 60 of these categories. Findings from this first application of the methodology should be considered exploratory and indicative. With a longer period of observation and the addition of further measurements, this methodology could be extended and adapted to a variety of national and supranational contexts, aiding policy decisions at various levels.

Keywords: Application, Art, Bibliometric, Bibliometrics, Character, Decisions, Development, Excellence, First, Italy, Mapping Excellence, Methodology, Multidimensional, National, Nations, Observation, Organizations, Policies, Policy, Public, Public Research Organizations, Research, Research Evaluation, Science, Sciences, Scientific Excellence, State, The State, Universities, Work

# Title: Evidence-Based Complementary and Alternative Medicine

Full Journal Title: [Evidence-Based Complementary and Alternative Medicine](http://www.ncbi.nlm.nih.gov/pmc/journals/241/); [Evidence-Based Complementary and Alternative Medicine](http://ecam.oxfordjournals.org/archive/)

ISO Abbreviated Title: Evid.-based Complement Altern. Med.

JCR Abbreviated Title: Evid-Based Compl Alt

ISSN: 1741-427X

Issues/Year: 4

Language: English

Journal Country/Territory: England

Publisher: Oxford Univ Press

Publisher Address: Great Clarendon St, Oxford OX2 6DP, England

Subject Categories:

Integrative & Complementary Medicine: Impact Factor 2.064, 3/17 (2009)

# Title: Evidence-Based Dentistry

Full Journal Title: [Evidence-Based Dentistry](http://www.nature.com/ebd/archive/index.html)

ISO Abbreviated Title:

JCR Abbreviated Title: Evid Based Dent

ISSN: 1462-0049 (Print), 1476-5446 (Electronic)

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor,

? Welbury, R. (2007), Torn labial frenum in isolation not pathognomonic of physical abuse. *Evidence-Based Dentistry*, **8** (3), 71.

Full Text: [2007\Evi-Bas Den8, 71.pdf](2007/Evi-Bas%20Den8,%2071.pdf)

Abstract: DATA SOURCE: Searches were made for studies using Applied Social Sciences Index and Abstracts, Caredata (the social work and social care knowledge base), Child Data (the National Children’s Bureau Database), the Cumulative Index to Nursing and Allied Health, Embase, MEDLINE, the System for Information on Grey Literature in Europe, the TRIP database (www.tripdatabase.com), Sciences Citation Index, and ISI Proceedings (covers conference papers in all scientific and technical fields). Authors were contacted where necessary. STUDY SELECTION: All studies of children 0-18 years with intra-oral injuries because of physical child abuse, and torn labial frena of any aetiology, in live and fatal cases were included. Review articles, expert opinion or guidelines that did not include primary evidence, studies with mixed adult and child data where the children’s data could not be extracted, studies that addressed complications or management of abusive injuries, intra-oral injuries because of sexual abuse, thermal injuries or dental neglect were excluded. DATA EXTRACTION and SYNTHESIS: Studies were reviewed by the Welsh Child Protection Systematic Review Group. Standardised data extraction and appraisal forms were used and a qualitative synthesis undertaken. RESULTS: Nineteen out of 154 studies reviewed were included, representing 591 children. There were no comparative studies of accidental and abusive torn labial frenum to enable a probability of abuse to be determined. Nine studies documented abusive torn labial frena in 27 children, of whom 22 were younger than 5 years old and 24 had been fatally abused. Only a direct blow to the face was substantiated as a mechanism of injury. Two studies noted accidentally torn labial frena, both from intubation. Abusive intra-oral injuries were widely distributed to the lips, gums, tongue and palate and included fractures, intrusion and extraction of the dentition, bites and contusions. CONCLUSIONS: Current literature does not support the diagnosis of abuse based on a torn labial frenum in isolation. The intra-oral hard and soft tissue should be examined in all suspected abuse cases, and a dental opinion sought where abnormalities are found.ome of the traditional and normative predictors of successful outcomes.

Keywords: Abuse, Adult, Aetiology, Care, Child, Child Abuse, Children, Complications, Data, Database, Diagnosis, Distributed, Europe, Evidence, Expert Opinion, Extraction, Guidelines, Injury, ISI, Knowledge, Knowledge Base, Literature, Management, Mechanism, Mechanism of Injury, Neglect, Outcomes, Papers, Physical, Predictors, Primary, Qualitative, Selection, Sexual Abuse, Social, Support, Synthesis, Work

# Title: Evolutionary Trends in Plants

Full Journal Title: Evolutionary Trends in Plants

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Pryor, J.S. (1993), Patterns of ecological succession within the upper Pennsylvanian Duquesne coal of Ohio (USA). *Evolutionary Trends in Plants*, **7** (2), 57-66.

Abstract: Root penetration analysis was used as a quantitative test of probable order of species turnover within the ancient peat-accumulating swamp preserved by the Late Pennsylvanian (Stephanian B equivalent) age Duquesne Coal of Ohio (USA). Quantitative results support the following model: Initial stages of peat accumulation in the ancient swamp were dominated by aerial debris from vegetation growing near the swamp margin. Through this debris grew an assemblage of plants dominated by the lycophyte Chalaneria cormosa. There was a gradual transition to an assemblage dominated by a pteridosperm and tree fern canopy with numerous gymnospermous and pteridophytic subcanopy species, and extensive herbaceous ground cover of the zygopterid fern Corynepteris. Late stages of ecological succession were dominated by Psaronius tree ferns.

Keywords: Ecological Succession, Late Pennsylvanian, Peat Accumulating Coal Swamp, Duquesne Coal

# Title: Experimental Astronomy

Full Journal Title: Experimental Astronomy

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor,

? Trimble, V. (2009), Telescopes in the mirror of scientometrics. *Experimental Astronomy*, **26** (1-3), 133-147.

Full Text: [2009\Exp Ast26, 133.pdf](2009/Exp%20Ast26,%20133.pdf)

Abstract: Counting papers and citations is one way to estimate the significance of particular astronomical telescopes and other facilities in the long time gap between the verdict of history and the referee’s report on your most recent proposal. This has been done for 2,184 observational astronomy papers published between 1960 and 1964 (with 14,237 citations in 1965-1969) and the numbers looked at in various ways. The extreme dominance of California in optical astronomy and of the UK and Australia in radio astronomy provides the background against which ESO, NOAO, NRAO, and A&A were founded, with equality of access to facilities having increased enormously in the intervening 40 years, but inequality of results having increased slightly. A number of other factoids about astronomical publications, the community, and their environments surfaced during the counting process, and a subset reported here, including a few pertaining to the more distant past.

Keywords: Citation Analysis, Citations, Gamma Rays, Gap, History, Publications, Scientometrics, UK

# Title: Experimental Cell Research

Full Journal Title: [Experimental Cell Research](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6791&_auth=y&_acct=C000050221&_version=1&_urlVersion=0&_userid=10&md5=b24003c58593b65eca354b767daeda94)

ISO Abbreviated Title: Exp. Cell Res.

JCR Abbreviated Title: Exp Cell Res

ISSN: 0014-4827

Issues/Year: 12

Journal Country/Territory: United States

Language: Multi-Language

Publisher: Academic Press Inc

Publisher Address: 525 B St, Ste 1900, San Diego, CA 92101-4495

Subject Categories:

Oncology Cell Biology: Impact Factor

? Venetta, B.D. and Shure, A.Q. (1961), Adsorption isotherm studies of unfixed S-37-A and ehrlich ascites tumor cells using acridine orange. *Experimental Cell Research*, **24** (3), 570-??.

Kulp, K.S., Green, S.L., Vulliet, P.R. (1996), Iron deprivation inhibits cyclin-dependent kinase activity and decreases cyclin D/CDK4 protein levels in asynchronous MDA-MB-453 human breast cancer cells. *Experimental Cell Research*, **229** (1), 60-68.

Full Text: [E\Exp Cel Res229, 60.pdf](E/Exp%20Cel%20Res229,%2060.pdf)

Abstract: Iron chelation, known to block progression through the cell cycle, was examined for effects on the activity and subunit levels of the cyclin-dependent protein kinases (cdk). Treatment of asynchronous MDA-MB-453 cells with the iron chelators mimosine or desferrioxamine (DFO) for 24 h stopped cell division, but did not produce a single, synchronous block. DNA content analysis demonstrated that although a majority of the cells were blocked in G1 (87.3%), an unexpectedly large fraction of the cells were blocked in S phase (11.5%). Western blot analysis of the treated lysates demonstrated the presence of cyclin B, confirming that part of the cell population was blocked in S phase. After release from mimosine treatment, 84% of the cell population remained in G1 up to 8 h. Treating breast cancer cells with 400 µM mimosine for 24 h inhibited cyclin E-and cyclin A-associated kinase activity by 85% or more, although immunoblots using anti-cyclin A, cyclin E, cdc2, and cdk2 antibodies showed that these key subunits were still present in the cells at pretreatment levels. Interestingly, Western blot analysis also demonstrated that iron chelation decreased the protein levels of the cyclin D and cdk4 subunits as compared to control and produced a change in retinoblastoma protein phosphorylation. These results indicate that iron deprivation effects the activity and protein levels of the cyclin-dependent kinases, and ultimately, the pathways that control cell division. (C) 1996 Academic Press, Inc.

Keywords: Mammalian Ribonucleotide Reductase, Chinese-Hamster Cells, Plant Amino-Acid, DNA-Synthesis, S-Phase, T-Cells, Mimosine, Replication, Gene, Progression

Delehedde, M., Deudon, E., Boilly, B. and Hondermarck, H. (1996), Heparan sulfate proteoglycans play a dual role in regulating fibroblast growth factor-2 mitogenic activity in human breast cancer cells. *Experimental Cell Research*, **229** (2), 398-406.

Full Text: [E\Exp Cel Res229, 398.pdf](E/Exp%20Cel%20Res229,%20398.pdf)

Abstract: The human breast cancer cell Lines MCF-7 and MDA-MB-231 differ in their responsiveness to fibroblast growth factor-a (FGF-S). This growth factor stimulates proliferation in well-differentiated MCF-7 cells, whereas the less well-differentiated MDA-MB-231 cells are insensitive to this molecule, To investigate the potential regulation of FGF-2 mitogenic activity by heparan sulfate proteoglycans (HSPG), we have treated human breast cancer cells by glycosaminoglycan degrading enzymes or a metabolic inhibitor of proteoglycan sulfation: sodium chlorate. The interaction between FGF-2 and proteoglycans was assayed by examining the binding of I-125-FGF-2 to breast cancer cell cultures as well as to eationic membranes loaded with HSPG. Using MCF-7 cells, we showed that heparinase treatment inhibited FGF-2 binding to HSPG and completely abolished FGF-2 induced growth, chlorate treatment of MCF-7 cells decreased FGF-2 binding to HSPG and cell responsiveness in a dose-dependent manner. This demonstrates a requirement of adequately sulfated HSPG for FGF-2 growth-promoting activity on MCF-7 cells. In highly invasive MDA-MB-231 cells which produce twice as much HSPG as MCF-7 cells and which are not normally responsive to exogenously added FGF-2, chlorate treatment decreased FGF-2 binding to HSPG and induced FGF-2 mitogenic effect. This chlorate effect was dose dependent and observed at concentrations of 10-30 mM, higher chlorate concentrations completely abolished the FGF-2 effect. This shows that the HSPG level of sulfation can also negatively regulate the biological activity of FGF-2. Taken together, these results demonstrate a crucial role far HSPG in both positive and negative control of FGF-2 mitogenic activity in breast cancer cell proliferation. (C) 1996 Academic Press, Inc.

Keywords: Affinity Binding-Sites, Smooth-Muscle Cells, Extracellular-Matrix, Differential Responsiveness, Proteolytic Degradation, Receptor Dimerization, FGF, Expression, Genes, BFGF

# Title: Experimental and Clinical Transplantation

Full Journal Title: Experimental and Clinical Transplantation

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor,

? Bas, K.K., Gunay, L.M. and Besim, H. (2011), Turkey’s evaluation in kidney transplantation research. *Experimental and Clinical Transplantation*, **9** (5), 319-322.

Full Text: 2011\Exp Cli Tra9, 319.pdf

Abstract: Objectives: The objective this study is to evaluate the trend of Turkey’s contribution in terms of number of publications included in the Science Citation Index Expanded in kidney transplantation between 1980 and 2009. Materials and Methods: All scientific papers published included in Science Citation Index Expanded in the English language between 1980 and 2009 were analyzed using the “Web of Science.” A general search was conducted using key words of “kidney transplantation,” “renal transplantation,” “kidney transplant,” and “renal transplant.” We analyzed these results using the “analyze” function of the software in terms of countries, documentation types, number in years of publications, journals, and institutes. We also used the same function separately analyze papers from Turkey in last 3 decades between 1980 and 1989, 1990 and 1999, and 2000 and 2009 for statistical evaluation. Results: In total, we found 46 983 papers related to kidney transplant were published included in the Science Citation Index Expanded in the English language between 1980 and 2009. Overall, 964 of those papers were from Turkey (2.05%). There were 12 papers from Turkey between 1980 and 1989, 200 papers between 1990 and 1999, and 752 papers between 2000 and 2009. The rank of Turkey among other countries, ranked by the number of papers published, was 33 between 1980 and 1989 and 11 between 2000 and 2009. Conclusions: Turkey has shown a significant positive trend in publishing papers in the field of kidney transplantation-further evidence of the progress Turkey has made in its contributions to the field of kidney transplantation in recent decades.

Keywords: Bibliometric Analysis, Citation, Contribution, Documentation, English, Evaluation, Journals, Kidney, Kidney Transplant, Kidney Transplantation, Methods, Papers, Publications, Publishing, Renal Failure, Research, Research Activities, Science, Science Citation Index, Software, Statistical, Transplantation, Trend, Turkey

# Title: Experimental Gerontology

Full Journal Title: [Experimental Gerontology](http://www.sciencedirect.com/science/journal/05315565)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN: 0531-5565

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor,

? Rebar, R.W. (1994), Unanswered questions in hormonal replacement therapy. *Experimental Gerontology*, **29** (3-4), 447-461.

Full Text: [1994\Exp Ger29, 447.pdf](1994/Exp%20Ger29,%20447.pdf)

Abstract: This review addresses many of the unanswered questions existing relative to the use of exogenous estrogens and progestins in postmenopausal women (PMW). The literature in the field is reviewed and summarized, with a particular effort to identify key questions of major concern. The effect of selection bias on conclusions reached from retrospective studies involving hormone replacement therapy (HRT) has not been examined. Less is actually known about the effects of progestins than estrogens. Many of the endocrine changes that occur with aging remain poorly defined. Effects of estrogens and progestins on the breast and on breast cancer are unclear. Estrogens have recognized beneficial effects and progestins have detrimental effects on lipoprotein metabolism. Estrogens also have direct effects on the vasculature and may impact on cardiovascular risk in other ways. Although estrogens are the only agents known to eliminate hot flushes, the mechanism by which flushes arise is not known. Estrogens may have ameliorating effects on mood and behavior and may improve dementia, but research in this area has been limited to date. Lastly, the preferred estrogens and progestins, their dosages and routes of administration, remain to be more completely defined.

Keywords: Hormone Replacement Therapy (Hrt), Estrogen Replacement Therapy (Ert), Estrogens, Progestins, Postmenopause, Agonadal Women, Breast Cancer, Osteoporosis, Vasomotor (Hot) Flushes, Cardiovascular Effects, Postmenopausal Bone Loss, Coronary-Artery Disease, Breast-Cancer, Estrogen Replacement, Medroxyprogesterone Acetate, Calcium Supplementation, Endometrial Carcinoma, Conjugated Estrogens, Menopausal Women, Stimulate Human

? von Zglinicki, T. (2000), Research on ageing in Germany. *Experimental Gerontology*, **35** (3), 259-270.

Full Text: [2000\Exp Ger35, 259.pdf](2000/Exp%20Ger35,%20259.pdf)

Abstract: The present review on ageing research in Germany is biased towards experimental biogerontology, because this is the field which will define the future of ageing research as a whole. Tn absolute numbers of publications between 1995 and 1999, Germany is comparable to other large European countries. However, Germany ranks definitively last among 10 major developed countries if the numbers of scientific papers per year are seen in relation to the economic capability. This is true for the whole of biomedical research, but it is even more exaggerated for ageing research. There are potent groups in German ageing research capable of producing a good fraction of high-impact papers, however. There are many more researchers in areas highly relevant to gerontology which recently became attracted by gerontological problems. However, the importance of modern biogerontology has not made clear to decision-makers in Germany, so that structural and financial limitations will probably prevent any significant rise in the near future, which would be necessary to keep Germany along with other developed countries. (C) 2000 Elsevier Science Inc. All rights reserved.

Keywords: Alzheimers-Disease, Amyloid Precursor Protein, Beta, Journal Impact Factor, Life-Span, Limitations, Messenger-RNA, Publications, Research, Review, Senescence, Speaking Countries, Superoxide-Dismutase, Transcription Factor

# Title: Experimental Hematology

Full Journal Title: [Experimental Hematology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6200&_auth=y&_acct=C000011279&_version=1&_urlVersion=0&_userid=1134284&md5=0a03f92b0e2ffad7cb798ca1a96b8870)

ISO Abbreviated Title:

JCR Abbreviated Title:

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Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor,

Locatelli, F., Rondelli, D. and Burgio, G.R. (2000), Tolerance and hematopoietic stem cell transplantation 50 years after Burnet’s theory. *Experimental Hematology*, **28** (5), 479-489.

Full Text: [E\Exp Hem28, 479.pdf](E/Exp%20Hem28,%20479.pdf)

Abstract: Objective: In 1949, the original formulation of Burnet’s theory on the mechanisms responsible for the capacity of the immune system to discriminate between foreign antigens (i.e., the “non-self”) and the cells of its own body (i.e., the “self”) was published. Since then, further refinements and reconsiderations of the basic concepts underlying the achievement of a state of tolerance toward a certain antigen have been reported. Here, we attempt to analyze critically new clinical and experimental strategies aimed at inducing alloantigen-specific unresponsiveness.

Data Sources: The data discussed in this review are drawn from articles and abstracts published in journals covered by the *Science Citation Index* ***and*** Medline.

State of the Art: Induction of tolerance toward alloantigens still remains one of the most elusive goals of clinical immunology. Until now, nonspecific immunosuppressive drugs have been used to successfully perform both solid organ and hematopoietic stem cell transplantation. However, using this approach, patients given an allograft are exposed to the threat of infections, tumors, and other side effects. Moreover, in solid organ transplant recipients, permanent tolerance toward the graft’s alloantigens is never achieved. Recently, considerable progress has been made in expanding our knowledge of transplant tolerance. The traditional model of central tolerance, derived from Burnet’s concept, has been complemented by knowledge of mechanisms of peripheral tolerance. New experimental and therapeutic trials based on the blockade of costimulatory molecules, as well as on generation and infusion of either regulatory or nonimmunogenic cells, have been recently proposed for inducing alloantigen-specific tolerance.

Conclusions: The achievements obtained in understanding the mechanisms of unresponsiveness toward non-self antigens are fundamental prerequisites for successful allogeneic transplants, and they could open a new exciting era of specific, immunosuppressive therapies.

Keywords: Tolerance, Immune Response, Costimulatory Molecules, Hematopoietic Stem Cell Transplantation, Cytokines, Dendritic Cells

? Miller, J.S. (2001), The biology of natural killer cells in cancer, infection, and pregnancy. *Experimental Hematology*, **29** (10), 1157-1168.

Full Text: [2001\Exp Hem29, 1157.pdf](2001/Exp%20Hem29,%201157.pdf)

Abstract: Objective. NK cells are important cells of the immune system. They are ultimately derived from pluripotent hematopoietic stem cells. NK cell cytotoxicity and other functions are tightly regulated by numerous activating and inhibitory receptors including newly discovered receptors that selectively recognize major histocompatibility complex class I alleles. Based on their defining function of spontaneous cytotoxicity without prior immunization, NK cells have been thought to play a critical role in immune surveillance and cancer therapy. However, new insights into NK cell biology have suggested major roles for NK cells in infection control and uterine function. The purpose of this review is to provide an update on NK cell function, ontogeny, and biology in order to better understand the role of NK cells in health and disease.

Data Sources. In the Medline database, the major subject heading “Natural Killer Cells” was introduced in 1983, identifying 16,848 citations as of December 31, 2000. Since 1986, there have been approximately 1000 citations per year under this subject heading. In this database, 68% of manuscripts are limited to human NK cells; 40% of citations cross with the major subheading of cytotoxicity, 40% with cytokines, 36% with neoplasm, 5% with antibody-dependent cellular cytotoxicity, 2.8% with pregnancy, and 1.3% with infection. Of references from the year 2000–2001, 46 were selected to combine with contributions from earlier literature.

Conclusions. NK cells should no longer be thought of as direct cytotoxic killers alone as they clearly serve a critical role in cytokine production which may be important to control cancer, infection, and fetal implantation. Understanding mechanisms of NK cell functions may lead to novel therapeutic strategies for the treatment of human disease.

# Title: Experimental and Molecular Pathology

Full Journal Title: [Experimental and Molecular Pathology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=6790&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=d1ef213359a804006d0f45c0c0d44b93)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

Mark, H.F.L., Bai, H.W., Sotomayor, E., Mark, S. and Rintels, P. (2000), Hypotetraploidy in a patient with small cell carcinoma. *Experimental and Molecular Pathology*, **68** (1), 70-76.

Full Text: [E\Exp Mol Pat68, 70.pdf](E/Exp%20Mol%20Pat68,%2070.pdf)

Abstract: While numerical and structural chromosomal abnormalities characterize many hematopoietic and nonhematopoietic malignancies, the occurrence of polyploidy is by and large rare. We report here an interesting patient with small cell carcinoma (SCC) and hypotetraploidy initially referred to us because of a question of acute nonlymphocytic leukemia, M3 subtype, with a question of a 15,17 translocation characteristic of acute promyelocytic leukemia. However, the patient did not have a 15,17 translocation and the final hematopathologic analysis of the bone marrow aspirates and immunohistochemistry studies subsequently revealed the patient to have SCC. Small cell carcinoma is a highly malignant and a very aggressive neoplasm. A review of the literature, using Medline, Cancerlit, and the Science Citation Index, revealed that in most, if not all, reports, the presence of polyploidy is noted as a rare entity. In leukemia, reports of polyploidy point to a distinct category of patients with a poor risk for which more intensive treatment is needed. Limited information is currently available to assess the risk of polyploidy in small cell carcinoma. Our case is important not only because of the relative rarity of polyploidy, but also because insights gained from the study of this and other similar patients may help shed additional light on the mechanism of carcinogenesis, which is not fully known to date. As polyploidization is a manifestation of genetic instability and as genetic instability has been implicated in the genesis and progression of many cancers, it is perhaps not too surprising that polyploidy in our case was associated with a poor disease outcome. The patient has since expired.

Keywords: Hypotetraploidy, Near-Tetraploidy, Polyploidy, Small Cell Carcinoma, Tetraploidy

# Title: Experimental Psychology

Full Journal Title: [Experimental Psychology](http://www.sciencedirect.com/science?_ob=JournalURL&_cdi=12988&_auth=y&_acct=C000047720&_version=1&_urlVersion=0&_userid=2007471&md5=cc5cf77d3e262378c1a5454133b45ea3)

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Dinkel, A., Berth, H., Borkenhagen, A. and Brähler, E. (2004), On raising the international dissemination of german research: Does changing publication language to english attract foreign authors to publish in a german basic psychology research journal? *Experimental Psychology*, **51** (4), 319-328.

Full Text: [2004\Exp Psy51, 319.pdf](2004/Exp%20Psy51,%20319.pdf)

Abstract: It has been proposed that German basic psychology journals should change publication language to English in order to facilitate access to research from German-speaking countries. However, to truly increase the dissemination of German research, it seems crucial to progress towards an internationalization of authors and readers. We applied bibliometric analysis to investigate the impact of the transition to English on the rate of foreign authors publishing in *Zeitschrift für Experimentelle Psychologie*/*Experimental Psychology*, as well as possible associated changes in citation patterns. There was an increase in the rate of articles published by foreign authors from 14.6 and 8.7 per cent, respectively, for the last biannual periods as German-language journal, to 52.7 per cent in the first biannual period as English-language journal. Regarding citations patterns, the clearest changes emerged for domestic authors. The results illustrate possible consequences of a transition to English as publication language, and reveal that *Experimental Psychology* has successfully established certain prerequisites for an increase of the international dissemination of German psychology research.

Keywords: Acquisition, Affective Simon Task, Bibliometric, Bibliometric Analysis, Bibliometry, Citation, Citations, German Psychological Research, Hindsight Bias, Implicit Association Test, Information, Internationalization, Internet, Journal, Journals, Memory, Mental Models, Publication, Publishing, Recognition, Research, Stereotypes

# Title: Expert Opinion on Biological Therapy

Full Journal Title: Expert Opinion on Biological Therapy

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Zhao, Q. and Ye, X.F. (2011), Additive value of adult bone-marrow-derived cell transplantation to conventional revascularization in chronic ischemic heart disease: A systemic review and meta-analysis. *Expert Opinion on Biological Therapy*, **11** (12), 1569-1579.

Full Text: 2011\Exp Opi Bio The11, 1569.pdf

Abstract: Objective: Whether adult bone marrow (BM)-derived cells (BMCs) transplantation benefits patients with chronic ischemic heart disease (IHD) remains controversial. This systemic and meta-analysis study aimed to assess the potential therapeutic effects of BMCs transplantation with revascularization in chronic IHD. Research design and methods: Randomized controlled trials of BMCs in combination with coronary artery bypass grafting (CABG) or percutaneous coronary intervention (PCI) for chronic IHD were identified by searching Med-line, Embase, the Cochrane Controlled Trials Register, the Cochrane Library, and the Web of Science. We conducted a random-effects meta-analysis across eligible studies measuring the same outcomes. Results: Ten randomized controlled trials including 422 participants were reviewed. In the trials with six months of follow-up, BMCs transplantation improved left ventricular (LV) ejection fraction (LVEF) by 4.02% and reduced LV end-systolic and end-diastolic volumes. Subgroup analysis revealed a statistically significant difference in LVEF associated with primary intervention, route of cell delivery, cell type, and baseline LVEF, but not with cell dose or storage duration. Conclusions: Selected-BMCs transplantation through myocardial injection after surgical revascularization may benefit patients with chronic IHD and severely impaired LV function. Due to the limitation of patient number, RCT with larger sample size and long follow-up are required for future research.

Keywords: Acute Myocardial-Infarction, Adult, Analysis, Bone, Cell Transplantation, Chronic Ischemic Heart Disease, Cochrane, Coronary-Artery, Design, Disease, Follow-Up, Injection, Intervention, Intramyocardial Delivery, Left-Ventricular Function, Medline, Meta Analysis, Meta-Analysis, Mononuclear-Cells, Myocardial Infarction, Outcomes, Patients, Pci, Percutaneous Coronary Intervention, Primary, Progenitor Cells, Randomized Controlled Trials, Randomized Controlled-Trials, Research, Research Design, Review, Science, Stem Cells, Stem-Cells, Surgical, Systematic Review, Transplantation, Vessel Formation, Web of Science

# Title: Expert Opinion on Drug Delivery

Full Journal Title: Expert Opinion on Drug Delivery

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Petrenko, V.A. (2008), Evolution of phage display: From bioactive peptides to bioselective nanomaterials. *Expert Opinion on Drug Delivery*, **5** (8), 825-836.

Full Text: [2008\Exp Opi Dru Del5, 825.pdf](2008/Exp%20Opi%20Dru%20Del5,%20825.pdf)

Abstract: Background: New phage-derived biorecognition nanomaterials have emerged recently as a result of the in-depth study of the genetics and structure of filamentous phage and the evolution of phage display technology. Objective: This review focuses on the progress made in the development of these new nanomaterials and discusses the prospects of using phage as a bioselectable molecular recognition interface in medical and technical devices. Methods: The author used data obtained both in his research group and sourced using Science Citation Index (Web of Science) search resources. Results/conclusion: The merging of phage display technologies with nanotechnology over the past few years has proved promising and has already shown its vitality and productivity by contributing vigorously to different areas of medicine and technology, such as medical diagnostics and monitoring, molecular imaging, targeted drug and gene delivery, vaccine development, as well as bone and tissue repair.

Keywords: Author, Biosensors, Bone, Cancer-Therapy, Candida-Albicans, Citation, Coat Protein, Development, Drug, Drug Delivery, Evolution, Filamentous Bacteriophage, Gene Delivery, Gene Delivery, Genetics, Imaging, In-Vivo Selection, Landscape Phage, Mammalian-Cells, Medical, Medicine, Methods, Molecular, Molecular Imaging, Monitoring, Nanobiotechnology, Nanotechnology, Phage Display, Preclinical Manufacture, Research, Review, Salmonella-Typhimurium, Science, Science Citation Index, Vaccine, Web of Science

# Title: Expert Opinion on Drug Safety

Full Journal Title: Expert Opinion on Drug Safety

ISO Abbreviated Title:

JCR Abbreviated Title:

ISSN:

Issues/Year:

Journal Country/Territory:

Language:

Publisher:

Publisher Address:

Subject Categories:

: Impact Factor

? Marinucci, L., Balloni, S., Carinci, F., Locci, P., Pezzetti, F. and Bodo, M. (2011), Diazepam effects on non-syndromic cleft lip with or without palate: Epidemiological studies, clinical findings, genes and extracellular matrix. *Expert Opinion on Drug Safety*, **10** (1), 23-33.

Full Text: 2011\Exp Opi Dru Saf10, 23.pdf

Abstract: Importance of the field: This review analyses international studies investigating the combined genetic and environmental causes of cleft lip with or without cleft palate (CL/P) and describes successes and limitations in identifying underlying genetic and environmental factors. CL/P, the most common congenital facial malformation, is a major public health burden in terms of medical costs and emotional stress to patients and families. Because genetic and environmental factors determine risk of occurrence, CL/P has a complex, multifactor aetiology. Areas covered in this review: English language reports from 1980 to 2010 were searched for in Medline, PubMed, Science Citation Index, textbooks and review articles on drugs and pregnancy. Key words were diazepam or benzodiazepine(s) combined with cleft lip, cleft palate, oral malformations, prenatal exposure, GABA, gene expression and extracellular matrix. What the reader will gain: This review presents an updated assessment of the mutagenic and genotoxic effects of diazepam (DZ), one of the most commonly used benzodiazepines, on CL/P occurrence. Take home message: Data are divergent; more studies are needed for an in-depth picture of the effects of DZ during gestation on the child’s development, particularly on orofacial clefts.

Keywords: Alcohol-Consumption, Candidate Genes, Citation, Commonly Used Benzodiazepines, Complex, Congenital-Malformations, Development, Diazepam, English, Extracellular Matrix, Field, Gaba(A) Receptors, Genes, Language, Linkage Disequilibrium, Maternal Intake, Medical, Medline, Nonsyndromic Oral Clefts, Orofacial Clefts, Orofacial Clefts, Prenatal Exposure, Public Health, Pubmed, Receptor, Review, Science, Science Citation Index, Textbooks

? Abarientos, C., Sperber, K., Shapiro, D.L., Aronow, W.S., Chao, C.P. and Ash, J.Y. (2011), Hydroxychloroquine in systemic lupus erythematosus and rheumatoid arthritis and its safety in pregnancy. *Expert Opinion on Drug Safety*, **10** (5), 705-714.

Full Text: 2011\Exp Opi Dru Saf10, 705.pdf

Abstract: Introduction: The antimalarial drug hydroxychloroquine (HCQ) is widely used to treat various rheumatic diseases. Many autoimmune diseases occur in women of child-bearing age who may become pregnant while on therapy, which raises concerns regarding the teratogenicity of HCQ and its effect on the outcome of the pregnancy. There is a lack of data regarding the safety of HCQ during pregnancy. Areas covered: In this review, the authors attempt to identify relevant publications by searching MEDLINE, Cochrane database, Ovid-Currents Clinical Medicine, Ovid-Embase:Drugs and Pharmacology, EBSCO, Web of Science and SCOPUS using the search terms HCQ and/or pregnancy. A basis for the mechanism of action of HCQ is provided. Expert opinion: HCQ has been shown by numerous studies over the past 15 years to be efficacious in the treatment of autoimmune diseases, including systemic lupus erythematosus, discoid lupus erythematosus and rheumatoid arthritis. HCQ does not appear to be associated with any increased risk of congenital defects, spontaneous abortions, fetal death, prematurity or decreased numbers of live births in patients with autoimmune diseases. Therefore, in the author’s opinion, HCQ is safe for the treatment of autoimmune diseases during pregnancy.

Keywords: 3 Medications, Antimalarial-Drugs, Arthritis, Authors, B-Cells, Cochrane, Connective-Tissue Diseases, Discoid Lupus Erythematosus, Double-Blind, Drug, Fetal Death, Hydroxychloroquine, Long-Term, Mechanism, Mechanism of Action, Medline, Modifying Antirheumatic Drugs, Multiethnic US Cohort, Outcome, Patients, Pharmacology, Pregnancy, Publications, Retinal Toxicity, Review, Rheumatoid Arthritis, Risk, Safety, Science, Scopus, Systemic Lupus Erythematosus, T-Cells, Therapy, Treatment, Web of Science, Women

# Title: Expert Opinion on Investigational Drugs

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? Lonning, P.E. and Geisler, J. (2008), Indications and limitations of third-gene ration aromatase inhibitors. *Expert Opinion on Investigational Drugs*, **17** (5), 723-739.

Abstract: Background: Use of aromatase inhibitors in postmenopausal breast cancer, initially in advanced disease but recently also for adjuvant therapy, represents a major advance. Objective: To summarize research leading to this success and to review clinical data from large Phase III trials revealing efficacy of novel third-generation aromatase inhibitors in metastatic and early breast cancer. Methods: Literature on PUBMED and on ISI Web of Science for the last 10 years was searched using the word ‘aromatase’. Recent key presentations and abstracts are also included. Results/conclusion: Third-generation aromatase inhibitors improve relapse-free survival compared to tamoxifen, and some trials reveal a survival advantage in early breast cancer. Although substantial data now confirm the safety of these potent compounds with respect to bone metabolism and cardiovascular risk, there is a need for continuous long-term follow-up, in particular into potential vascular effects. The mechanisms and optimal treatment of musculoskeletal and joint pain remain to be addressed. Ongoing studies evaluate sequential treatment versus monotherapy, potential differences between individual compounds and optimal duration of treatment, as well as combining aromatase inhibitors with novel targeting agents.

Keywords: 3rd-Line Hormonal Treatment, Adjuvant Therapy, Advanced Breast-Cancer, Aromatase, Blind Randomized-Trial, Bone, Bone Metabolism, Bone-Mineral Density, Breast Cancer, Cancer, Cardiovascular, Cardiovascular Risk, Coronary-Heart-Disease, Disease, Efficacy, Endocrine Therapy, Estrogen, Extended Adjuvant Therapy, First-Line Therapy, Follow-Up, Indications, Isi, Methods, Monotherapy, Pain, Phase-Ii Trial, Plasma Estrogen-Levels, Postmenopausal Women, Pubmed, Research, Review, Risk, Safety, Science, Success, Survival, Therapy, Treatment, Web of Science

? Lonning, P.E. (2010), Evolution of endocrine adjuvant therapy for early breast cancer. *Expert Opinion on Investigational Drugs*, **19**, S19-S30.

Abstract: Endocrine treatment plays a pivotal role in the adjuvant therapy of patients harbouring oestrogen and/or progesterone receptor positive breast cancer. The objective of this paper is to critically review endocrine treatment options in early breast cancer focusing on ongoing development. Literature was collected through the ISI Web of Science and PUBMED in January/February 2009 with subsequent update by December 2009, using the words breast cancer, endocrine therapy, oestrogen receptor and aromatase. Endocrine therapy improves outcome in early breast cancer. Yet several controversies remain. There has recently been a lack of general consensus regarding the limit of oestrogen receptor positivity. As for adjuvant therapy in general and use of aromatase inhibitors in particular, we need the results from ongoing studies to decide what may be the optimal duration of therapy and regimen (sequential treatment versus monotherapy; one drug compared with another). Further, there is a need to critically assess optimal use of endocrine therapy for metastatic disease among patients previously exposed to endocrine regimens in the adjuvant setting. While in general the mechanisms of resistance to endocrine therapy among ER positive tumours remains unknown, merging evidence suggest a role of different growth factor pathways, in particular HER-2 activation. Thus, particular attention is paid to the topic of HER-2 expression as a potential cause of endocrine resistance.

Keywords: Adjuvant Therapy, Aromatase, Aromatase Inhibitors, Attention, Breast Cancer, Cancer, Development, Disease, Drug, Endocrine Therapy, Estrogen-Receptor Status, Evolution, Hormone Binding Globulin, Isi, Luteinizing-Hormone, Monotherapy, Oestrogen, Oestrogen Receptor, Outcome, Phase-Iii, Plasma-Levels, Postmenopausal Women, Premenopausal Patients, Progesterone, Pubmed, Randomized-Trial, Resistance, Review, Science, Tamoxifen Therapy, Therapy, Treatment, Tumours, Web of Science

? Ghaith, O., El-Halabi, M., Hashash, J.G. and Sharara, A.I. (2010), Investigational agents for the irritable bowel syndrome. *Expert Opinion on Investigational Drugs*, **19** (10), 1161-1178.

Abstract: Importance of the field: Irritable bowel syndrome (IBS) is a common disorder with significant health and economic consequences. The etiology of IBS is complex and appears to be multifactorial. Traditional IBS therapies have been directed primarily at the relief of individual symptoms but have been largely disappointing. This has triggered the search for newer treatment strategies with improved patient outcomes. Areas covered in this review: Enhanced knowledge about the putative pathophysiology of IBS has allowed the identification of new mechanistic targets for treatment. Our aim is to review emerging and promising drugs in the treatment of IBS based on disease pathophysiology. Data were extracted using MEDLINE and PUBMED search engines until January 2010. Abstracts were identified through ‘Web of Science’ and abstract supplements of major gastrointestinal scientific meetings. Drugs were classified according to mechanism of action and those with efficacy in trials involving human subjects examined. What the reader will gain: Additional insight into the pathophysiology as well as current and prospective treatments of IBS. Take home message: A multitude of putative drug targets have been identified and some novel treatments have progressed through to human clinical trials, but very few will be approved for the market in the near future. Moreover, and in keeping with the complex and multifactorial nature of this syndrome, it is unlikely that there will be one dominant and universally effective form of therapy for all IBS patients.

Keywords: 5-Ht4 Receptor Agonist, Abdominal Pain, Bloating, Circular Smooth-Muscle, Clinical Trials, Colonic Motor Function, Controlled Clinical-Trial, Corticotropin-Releasing-Factor, Defecation Disorder, Disease, Disorder, Drug, Drugs, Efficacy, Enteric Nervous-System, Etiology, Functional, Gastrointestinal, High Intrinsic Activity, Human, Irritable Bowel Syndrome, Knowledge, Mechanism, Mechanism of Action, Outcomes, Patient Outcomes, Placebo-Controlled Trial, Pubmed, Randomized Controlled-Trial, Review, Science, Symptoms, Tachykinin Nk2 Receptors, Therapy, Treatment, Web of Science

# Title: Expert Opinion on Therapeutic Patents

Full Journal Title: Expert Opinion on Therapeutic Patents

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? Mogee, M.E. and Kolar, R.G. (1998), Patent citation analysis of new chemical entities claimed as pharmaceuticals. *Expert Opinion on Therapeutic Patents*, **8** (3), 213-222.

Full Text: Exp Opi The Pat8, 213.pdf

Abstract: Patent references are of particular interest for technology analysis because they offer a measure of patent importance and a method of identifying links between patents. Citation analysis was performed on the set of all US patents issued during the years 1993 through late 1997 that cover new chemical entities (NCEs) claimed as pharmaceuticals. Merck & Co. heads the list, with 577 patents, almost 5% of the total, Hoechst Marion Roussel is second with 499 patents, about 4% of the total, and Eli Lilly is third with 337 patents, about 3% of all patents. However, Allergan, ranked 30th by its number of patents, is the top cited company, with 975 citations, almost all coming from subsequent Allergan patents. Merck is second with 779 citations. High levels of self-citation seem to predominate in NCE pharmaceuticals, perhaps reflecting the incentives to develop proprietary niches of in-depth knowledge and capability in the industry. Thus, looking at a company’s most highly cited patents may provide insight into the fields that it believes are most important. All 25 of Allergan’s highly cited patents are for NCEs having ‘retinoid like activity’ that are clearly related to Allergan’s development of retinoid medications for skin disorders. Similarly, all seven of American Home Products’ highly cited patents deal with one topic: rapamycin, an immunosuppressant. In the NCE pharmaceutical area, patent citations, and particularly self-citations, provide additional information beyond simple patent counts about the importance of particular lines of investigation to particular companies.

Keywords: Analysis, Citation, Citation Analysis, Citations, New Chemical Entities, Patents, Pharmaceutical, References, Self Citations, Self-Citation, Technology Cycle Time, US

? Mogee, M.E. and Kolar, R.G. (1999), Patent co-citation analysis of Eli Lilly & Co. patents. *Expert Opinion on Therapeutic Patents*, **9** (3), 291-305.

Full Text: 1999\Exp Opi The Pat9, 291.pdf

Abstract: This is the third in a series of articles that applies patent citation analysis to pharmaceutical patents. The authors use co-citation clustering to identify the major technology fronts that Eli Lilly & Co. is pursuing. The analysis covers all US patents assigned to Lilly and issued from 1975 through to 1998. Lilly’s patents fall into 132 Clusters, which in turn form 13 Groups. Statistics of self-citations to the Clusters identify technology fronts of key importance to Lilly. The authors examine the patents in one of these areas, pertaining to raloxifene and related compounds, in more detail. The article shows how the technique can take a large number of patents, almost 3,000 in this case, and organise them into Groups without the need for an expert to read and classify each. The technique quickly organises the patents in a portfolio and gives a starting paint that can help experts focus on areas of major importance or interest. A company can apply this technique to identify core areas of its patent portfolio, areas where it might face stiff competition, areas where others have found value within its patent portfolio, and areas where licensing opportunities may exist. Competitors applying this technique can see areas of a rival’s strength and areas the rival has abandoned or is not following up on.

Keywords: Analysis, Citation, Citation Analysis, Citations, Clusters, Compounds, Eli Lilly, Indicators, Patent, Patents, Pharmaceutical, Self-Citations, Technology, US

# Title: Expert Review of Medical Devices

Full Journal Title: Expert Review of Medical Devices

ISO Abbreviated Title:

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? Lai, W.F. (2011), In vivo nucleic acid delivery with PEI and its derivatives: Current status and perspectives. *Expert Review of Medical Devices*, **8** (2), 173-185.

Abstract: Poly(ethylenimine) (PEI) has recently emerged as a favorable candidate for nucleic acid (NA) delivery because of its good effectivity at low cost. Despite copious derivatives and formulations being explored over the years, there is a scarcity of efforts to systematically review the current status and unmet needs of related research. The objective of this article is to fill this gap by revisiting the recent advances and challenges in in vivo NA delivery mediated by PEI. For this, related literature was retrieved from Pub Med and Web of Science, and among the 530 articles yielded, 49 recent in vivo studies were selected for further analysis. Based on the distillation of literature, implications for research will be drawn and prospects of PEI-mediated NA delivery for stem cell- and RNA-based therapies will be explored. It is hoped that this article could add a new insight to the field and to clinical endeavors in the future.

Keywords: Analysis, Cationic Polymers, Enhance Immune-Response, Glycol-Polyethylenimine, DNA Complexes, In Vivo, Linear Polyethylenimine, Literature, Low-Molecular-Weight, Mesenchymal Stem-Cells, Nonviral Gene Delivery, Nonviral Vector, Nucleic Acid Delivery, PEI, PEI, DNA Complexes, Plasmid DNA Delivery, Poly(Ethylenimine), Pub Med, Receptor-Mediated Endocytosis, Research, Review, Science, Transgene Expression, Web of Science

# Title: Expert Systems with Applications

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? Chan, F.T.S. (2005), Application of a hybrid case-based reasoning approach in electroplating industry. *Expert Systems with Applications*, **29** (1), 121-130.

Full Text: [2005\Exp Sys App29, 121.pdf](2005/Exp%20Sys%20App29,%20121.pdf)

Abstract: Case-Based Reasoning (CBR), a well known Artificial Intelligence (At) technique, has already proven its effectiveness in numerous industries. In this research, we try to adopt CBR technique in electroplating industry where the final products are electroplated accessory of watches. In order to ensure sufficient profit margin for electroplating manufacturer, it is important to grasp the coating weight of electroplating component accurately so that salespersons can make sure their quotation prices cover the precious metal cost. Apart from quotation accuracy, responsiveness is also a critical competitive edge in electroplating industry. In this connection, developing a quick response decision-making system with considerably reliable price is what electroplating industry needs. To cope with this problem, a hybrid CBR system combined with Rule-based Reasoning (RBR) and Fuzzy Logic (FL) concepts is established. Such system is capable to convert knowledge from experienced staff, simulate the ‘mind-set’ of decision maker in solving problem through acquisition of specific knowledge and experience, and build up self-learning characteristics. Moreover, this research interprets cases as some objective selection rules, putting CBR in a position much closer to RBR. This innovative concept differentiates from previous CBR researcher work, and will be explained through a practical example. Further, this research also suggested that it is very difficult and not practical to develop a pure CBR system. Applying some subjective guiding rules in CBR can significantly improve the performance of system in the early learning stage. (c) 2005 Elsevier Ltd. All rights reserved.

Keywords: Case-Based Reasoning, Rule-Based Reasoning, Fuzzy Logic, Artificial Intelligence, Electroplating Industry, Knowledge Acquisition, Design, System

? Tseng, Y.H. (2010), Generic title labeling for clustered documents. *Expert Systems with Applications*, **37** (3), 2247-2254.

Full Text: [2010\Exp Sys App37, 2247.pdf](2010/Exp%20Sys%20App37,%202247.pdf)

Abstract: Document clustering is a powerful technique to detect topics and their relations for information browsing, analysis, and organization. However, clustered documents require post-assignment of descriptive titles to help users interpret the results. Existing techniques often assign labels to clusters based only on the terms that the clustered documents contain, which may not be sufficient for some applications. To solve this problem, a cluster labeling algorithm for creating generic titles, based on external resources such as WordNet, is proposed. Our method first extracts category-specific terms as cluster descriptors. These descriptors are then mapped to generic terms based on a hypernym search algorithm. The proposed method has been evaluated on a patent document collection and a subset of the Reuters-21578 collection. Experimental results revealed that our method performs as anticipated. Real-case applications of these generic terms show promising in assisting humans in interpreting the clustered topics. Our method is general enough such that it can be easily extended to use other hierarchical resources for adaptable label generation.

Keywords: Hypernym Search, Clustering Labeling, Wordnet, Correlation Coefficient, Topic Identification

? Wen, W. (2010), An intelligent traffic management expert system with RFID technology. *Expert Systems with Applications*, **37** (4), 3024-3035.

Full Text: [2010\Exp Sys App37, 3024.pdf](2010/Exp%20Sys%20App37,%203024.pdf)

Abstract: This paper presents an intelligent traffic management expert system with RFID technology. The system provides both practically important traffic data collection and control information and can trace criminal or illegal vehicles such as stolen cars or vehicles that evade tickets, tolls or vehicle taxes. The system architecture consists of an RFID reader, a passive tag, a personal computer, a pair of infrared sensors, and a high-speed server with a database system. Based on RFID technology, the system collects and calculates average speed and average flow information on each road of a district area in a city. It then transmits the messages from all the congested roads in a district area to the server in the district center via a communication program. Through a flooding algorithm, each server in a district center exchanges and updates information with all neighbor servers in other district centers so all that the servers in various district centers can get all the latest congestion messages in a city. Therefore, a dynamic navigation system can find the shortest path that avoids congested roads. Meanwhile, we compare three types of tags for choosing a better solution for e-plates in the future. We also adopt infrared sensors for detecting cars that do not have a tag.

Keywords: Radio Frequency Identification’ Passive Tags’ Intelligent Traffic Management’ Shortest Path

# Title: Explore-the Journal of Science and Healing

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? Bao, T. (2011), Commentary on the cochrane review of stimulation of the wrist acupuncture point P6 for preventing postoperative nausea and vomiting. *Explore-the Journal of Science and Healing*, **7** (4), 263-264.

Abstract: Background: Postoperative nausea and vomiting (PONV) are common complications following surgery and anaesthesia. Drugs to prevent PONV are only partially effective. An alternative approach is to stimulate the P6 acupoint on the wrist. This is an update of a Cochrane review first published in 2004. Objectives: To determine the efficacy and safety of P6 acupoint stimulation in preventing PONV. Search Strategy: TWe searched CENTRAL (The Cochrane Library, Issue 3, 2008), MEDLINE (January 1966 to September 2008), EMBASE (January 1988 to September 2008), ISI Web of Science (January 1965 to September 2008), the National Library of Medicine publication list of acupuncture studies, and reference lists of articles. Selection Criteria: All randomized trials of techniques that stimulated the P6 acupoint compared with sham treatment or drug therapy for the prevention of PONV. Interventions used in these trials included acupuncture, electroacupuncture, transcutaneous nerve stimulation, laser stimulation, capsicum plaster, an acu-stimulation device, and acupressure in patients undergoing surgery. Primary outcomes were the risks of nausea and vomiting. Secondary outcomes were the need for rescue antiemetic therapy and adverse effects. Data Collection and Analysis: Two review authors independently assessed trial quality and extracted the data. We collected adverse effect information from the trials. We used a random-effects model and reported relative risk (RR) with associated 95% confidence intervals (95% CI). Main Results: We included 40 trials involving 4,858 participants; four trials reported adequate allocation concealment. Twelve trials did not report all outcomes. Compared with sham treatment P6 acupoint stimulation significantly reduced: nausea (RR 0.71, 95% CI 0.61 to 0.83); vomiting (RR 0.70, 95% CI 0.59 to 0.83), and the need for rescue antiemetics (RR 0.69, 95% CI 0.57 to 0.83). Heterogeneity among trials was moderate. There was no clear difference in the effectiveness of P6 acupoint stimulation for adults and children; or for invasive and noninvasive acupoint stimulation. There was no evidence of difference between P6 acupoint stimulation and antiemetic drugs in the risk of nausea (RR 0.82, 95% CI 0.60 to 1.13), vomiting (RR 1.01, 95% CI 0.77-1.31), or the need for rescue antiemetics (RR 0.82, 95% CI 0.59-1.13). The side effects associated with P6 acupoint stimulation were minor. There was no evidence of publication bias from contour-enhanced funnel plots. Authors’ Conclusions: P6 acupoint stimulation prevented PONV. There was no reliable evidence for differences in risks of postoperative nausea or vomiting after P6 acupoint stimulation compared to antiemetic drugs.

Keywords: Adults, Adverse Effects, Anaesthesia, Authors, Bias, Children, Cochrane, Confidence Intervals, Drug, Drugs, Effectiveness, Efficacy, Embase, Information, ISI, Medline, Model, Outcomes, Prevention, Primary, Publication, Publication Bias, Relative Risk, Review, Risk, Safety, Science, Surgery, Therapy, Treatment, Web of Science

# Title: eXPRESS Polymer Letters

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